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Division of Farm Management and
Agricultural Economics

Trends in the Apple Industry

by

Chester C. Hampson

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Summary and Conclusions

The trend of total apple production in the United States has been downward since 1914; the trend of car-lot shipments has been downward since 1923, and the trend of commercial production has been slightly downward since 1926. Because of the wide annual fluctuations in yield, however, large crops will continue to be produced, with resulting low prices. Total production decreased 45 per cent in the Barrel States between the five years of peak production from 1911 to 1915 and the five years, 1927 to 1931, while in the Box States it increased 156 per cent during this period. These changes are less pronounced in commercial production and car-lot shipments. The trend of apple production in Washington has been decidedly upward since 1900.

The development of more extensive hard surfaced roads and mechanical improvements in motor vehicles have enlarged the areas in which motor trucks can operate with sufficient economy to offer keen competition for the railways. This situation has increased the competition against Washington apples by lowering the costs to apple growers in the Barrel States who are located closer to large consuming centers.

During the ten years from 1920 to 1930, there was a net decrease of 27 million bearing apple trees in the United States, 8 million of which were in the Box States and 19 million in the Barrel States. The number of bearing trees in the United States decreased 41 per cent. In the Barrel States, the decrease was 46 per cent, but in the Box States there was an increase of 10 per cent.

Plantings have also decreased. In 1930 there were less than one-half as many young non-bearing apple trees in the United States as there were in 1910. In the Barrel States, the number decreased 86 per cent, and in the Box States it had decreased 51 per cent.

Yield per tree in the United States has increased 80 per cent during the last 20 years. Between 1927 and 1931 the yield in the Box States averaged approximately 4.2 bushels per tree, and in the Barrel States 1.4 bushels per tree. In Washington the yield averaged about 1.3 bushels per tree between 1907 and 1911. By 1927 to 1931, it had increased to 6.1 bushels per tree, the highest of any state.

Yields per tree increase more rapidly during the first 10 or 12 years of commercial bearing than when the trees are older. The proportion of trees that have not attained bearing age and the proportion

that are in early commercial bearing indicate a coming increase in yield and total production. The number of trees reaching commercial bearing age will be much smaller during the next few years in the Box States than during the last few years but will remain about the same in the Barrel States. Nearly two-thirds of the apple trees in the commercial orchards of the United States were young trees of these ages in 1928.

The tendency to concentrate on a few varieties is more pronounced in the Box States than in the Barrel States. The five most important varieties in the Box States represented two-thirds of the total number of trees in 1928, while in the Barrel States the five main varieties accounted for only one-third of the trees. Delicious trees exceeded those of any other variety in the United States, and nearly three-fourths of them were less than 14 years of age. The Barrel States had over two and one-half times as many trees of this variety as the Box States. Although the Box States had more Delicious trees over 14 years of age than the Barrel States, they had less than one-fourth as many under 14 years old. During recent years there have been much heavier Delicious plantings in the Barrel States than in the Box States. There were almost as many Winesap as Delicious trees in the United States in 1928 but only about one-half as many under 14 years of age. Recent Winesap plantings have been much heavier in the Barrel States where there were over four times as many trees of this variety under 14 years of age in 1928 as there were in the Box States. Recent Jonathan plantings have been much heavier in the Barrel States which had about 10 times as many trees under 14 years old in 1928 as the Box States. Plantings of Rome Beauty during recent years have been lighter than those of Delicious, Winesap, or Jonathan

During the five years from 1926 to 1930, 17 per cent of the commercial apple crop of the United States was exported as fresh fruit of which Europe received 86 per cent. Great Britain alone took 51 per cent.

Washington apple prices are materially affected by export demand, particularly in Great Britain and Continental Europe. Although the fresh apple exports of the United States are now over four times the low level during the World War, the trend has risen very little during the five years from 1926 to 1930. Barriers have been raised against the importation of apples from the United States by most of our best foreign customers during recent years. In some countries, governmental aid is being given to domestic fruit industries. The elimination of trade barriers would be valuable to apple growers.

Since apples are consumed the year around, they compete with other fruits in their respective seasons. Competition for apples has

increased both in domestic and foreign markets because of the very rapid increase in the production of most of the major fruits during the last 10 or 20 years. This competition has tended to counteract the influence of decreased production and increased exports of apples.

Washington is the principal apple producing state. During the five years from 1927 to 1931, it produced about 19 per cent of the total crop of the United States, 28.5 per cent of the commercial crop, and 32.8 per cent of the car-lot shipments. During the same period, 86 per cent of its total crop was marketed through commercial channels as fresh fruit, as compared with 59 per cent in all other states, and 64 per cent in the United States as a whole.

In 1910, 62 per cent of the apple trees of Washington were non-bearing. Only 9 per cent of the trees had not attained bearing age in 1920. Since about 1915, the rate of planting has been gradually increasing again. In 1930 there were 73 per cent more bearing trees than in 1910 but 35 per cent less than in 1920, the peak having been reached about 1920.

Apple trees were eliminated from Washington orchards at the rate of at least 3.6 million a year between 1920 and 1930. This was more than the number planted and the number of bearing trees showed a net decrease of 2.8 million or 35 per cent during the 10 years.

The ages of the apple trees in Washington orchards indicate that more trees will reach the commercial bearing age annually during the next five years than during recent years. Approximately three-fourths of the apple trees of the state have either completed or soon will have completed their early bearing period, which will tend to retard a continued increase in yield per tree during the next few years. The tendency for apple production to continue to increase rapidly, because of the larger number of trees beginning to bear, will be somewhat offset by the effect of the slowing down in the increase in yield per tree.

The average planting space between trees in Washington in 1928 was between 25 and 26 feet.

Apple production in Washington is concentrated on a few varieties—Winesap, Delicious, Jonathan, and Rome Beauty accounting for over three-fourths of the apple trees of the state. These varieties, together with Yellow Newtown, Esopus Spitzenberg, Stayman, and Winter Banana account for nearly 90 per cent of the trees. One-half of the trees eight years of age or less in 1928 were Delicious, 28 per cent were Winesap, and 9 per cent were Rome Beauty, the three varieties accounting for about seven-eighths of the young trees of the state.

Recent Winesap plantings in Washington have hardly been sufficient to maintain the number of bearing trees, and fewer trees of this variety will be passing through the early bearing period during the next few years than formerly. Winesap production, therefore, will probably increase less rapidly within the next few years and later production may fail to increase.

The Delicious variety comprises 20 per cent of the apple trees of the state. Plantings of Delicious have been heavy since about 1920. Nearly one-half of the trees were between 14 and 23 years of age and only a few were over 23 years old in 1928, indicating that the number of trees passing through the early bearing period may be expected to remain about the same during the next few years. Delicious production will probably continue to increase at about the present rate during the next few years. At least part of the premium paid for that variety will probably disappear; the amount of price change will be due to both quantity and quality of the Delicious produced, particularly in the Barrel States where a large increase in Delicious production is in prospect.

About 16 per cent of the apple trees in the state are Jonathan. Over 90 per cent of these have either completed or soon will complete the early bearing period, and plantings during recent years have been insufficient to maintain the number of bearing trees. Jonathan production will probably begin to decrease soon and since production in the Barrel States will increase materially, Washington will become relatively less important in the production of this variety within a few years.

Indications point to heavier production of Rome Beauty apples in the Barrel States in the near future, but production will probably not increase rapidly in Washington for a few years. After the recent slightly heavier plantings begin to bear, production of that variety will probably increase somewhat more rapidly in Washington.

Since recent plantings of Yellow Newtown in Washington have been light and over 90 per cent of this variety have completed the early bearing period, appreciable increase in production does not appear to be in prospect.

In the Spokane, Walla Walla, and White Salmon districts, apple production declined 34 per cent during the 10 years ending with 1932, while the number of bearing trees decreased 70 per cent between 1920 and 1930.

Apple shipments from the Wenatchee-Okanogan district during the five years, 1926-30, averaged 19,764 cars annually or 53 per cent of the shipments of the state. This was an increase of 26 per cent over the preceding five-year period. Nearly 60 per cent of the shipments came from the vicinity of Wenatchee and the Wenatchee

Valley, 35 per cent from the Upper Columbia and the Okanogan country, and about 5 per cent from Grant and Douglas counties east of the vicinity of Wenatchee. Production is increasing in all of these areas.

Delicious, Winesap, Jonathan, and Rome Beauty accounted for about 80 per cent of the apple shipments between 1926 and 1930 and 85 per cent of the trees in 1931 in the Wenatchee-Okanogan district. There were more Delicious than Winesap trees, although shipments of Winesap exceed those of any other variety. The increase in Delicious production of recent years will probably continue, and after a few years the increase will probably become more rapid.

Light plantings and a smaller number of trees about to pass through the period of early bearing indicate that the production of Winesaps will probably not increase as rapidly during the next few years. Very light plantings, tree removals, and comparatively old trees appear to forecast a decrease in Jonathan production within a few years. Rome Beauty production in the district will probably continue to increase moderately. If present trends do not change materially, apple production will continue to increase in the Wenatchee-Okanogan district and a large part of the new tonnage will be Delicious.

During the 10 years ending in 1930, apple shipments from the Yakima district increased 19 per cent. Between 1926 and 1930, apple shipments averaged 15,234 cars a year or 42 per cent of those of the state. Shipments from below Union Gap have decreased almost 10 per cent during the last 10 years, while in the area above the Gap, production has increased 32 per cent during the same period.

Winesap, Jonathan, Rome Beauty, and Delicious are the most important varieties and accounted for 89 per cent of the shipments during the five years, 1926-30, and 91 per cent of the trees in 1931. About two-thirds of recent plantings have been Delicious and one-fourth Winesap. Winesap shipments will probably continue to increase during the next few years, although the rate of increase will probably decline. Delicious production will increase rapidly during the next few years, and the rate of increase may exceed that of recent years. Jonathan, Rome Beauty, and Yellow Newtown will probably increase little, if any, in the near future.

Present trends indicate shifts in production from lower-priced varieties to Delicious. A shift in production from the Lower Yakima Valley to the Upper Yakima Valley is also in evidence.

TRENDS IN THE APPLE INDUSTRY

by

Chester C. Hampson

OBJECT AND SCOPE

The purpose of this analysis is to determine the prospects in the apple industry, considering quantity of production, recent plantings and market possibilities, and particularly to estimate the future situation of apple growers of Washington. The study has been made from data for the United States for the Box and Barrel states, the geographic divisions of the United States, for Washington and the various districts of the state. Exports of apples have been of considerable importance and the probabilities concerning future foreign markets are indicated. Many shifts are taking place in varieties and in areas of production and a study of these has been made to indicate possible future shifts.

Conclusions that are given in this report are based on data available and probabilities for the future are given on the basis that trends will continue as indicated by conditions to the present time.

Many sources of data were drawn upon as a basis for this report. Among these are, (1) Statistics Relating to the Apple Industry, U. S. D. A., 1931 (mimeograph), (2) State Orchard Census of Washington, 1931, by the Division of Horticulture, State Department of Agriculture, Olympia, (3) Estimated Number of Apple Trees by Varieties and Ages in Commercial and Farm Orchards in Washington, January 1, 1928, U. S. D. A., Bureau of Agricultural Economics (mimeograph), (4) Statistics of Fruits and Vegetables, U. S. D. A. Yearbook, 1931 and other Yearbooks, (5) Testimony of O. B. Shay for the Wenatchee Valley Traffic Association before the I. C. C. in Docket 17,000, (6) Wenatchee Valley Traffic Association bulletins 537, 588, and 642, (7) Foreign Trade of the United States, Fruits, 1930 (Mimeograph) U. S. D. A., (8) Records of the Yakima Valley Traffic Association, (9) Crops and Markets, U. S. D. A., (10) Statistics and Charts of the Apple Industry, U. S. D. A. (mimeograph), (11) Northwest Boxed Apple Deal, 1922-23, etc., U. S. D. A. (mimeograph), (12) Marketing Northwestern Boxed Apples, 1926-27, etc., U. S. D. A., (mimeograph), (13) U. S. Census, (14) Monthly Summary of Foreign Commerce, U

S. Bureau of Foreign and Domestic Commerce (various reports), (15)
History of Wenatchee Valley Traffic Association, 1918 to 1930.

APPLE PRICES

Apple prices vary widely from year to year because of marked fluctuations in the size of the crop. Figure 1 shows the weighted average export price of apples for nearly a century and one-half.

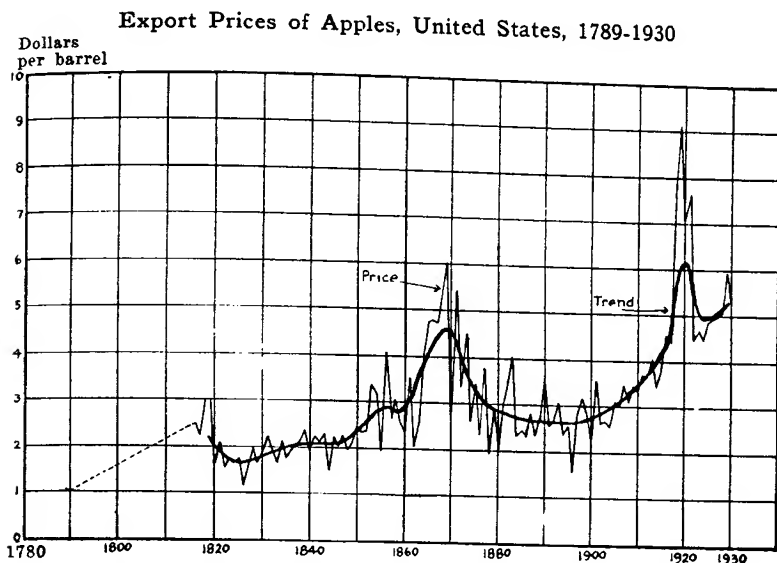


Figure 1. Apple prices fluctuate widely from year to year, but have been on a higher level since the World War than following the two other major war periods. The trend is a nine-year moving average. (Data from Table 1.)

There are several important facts shown by this graph: (1) Wide annual fluctuations constitute one of the hazards of apple raising. (2) In spite of these wide fluctuations, there has been a definite upward trend in apple prices during the last 100 years or more. This is illustrated more clearly by the adjusted price¹ as shown in Figure 2. (3) There have been three periods when apple prices were abnormally high, namely, (1) during the War of 1812 and Napoleonic Wars in Europe, (2) during the Civil War, and (3) during the World War. Following both of

¹The adjusted price of a commodity is the purchasing power of that commodity in terms of all commodities. Apple prices have been adjusted by dividing each price quotation by the corresponding index of wholesale prices of all commodities as reported in Farm Economics issued by Cornell University.

the first two war periods, prices were on a level somewhat higher than before the peak but below peak prices.

Adjusted Export Prices of Apples, United States, 1816-1930

Dollars
per barrel

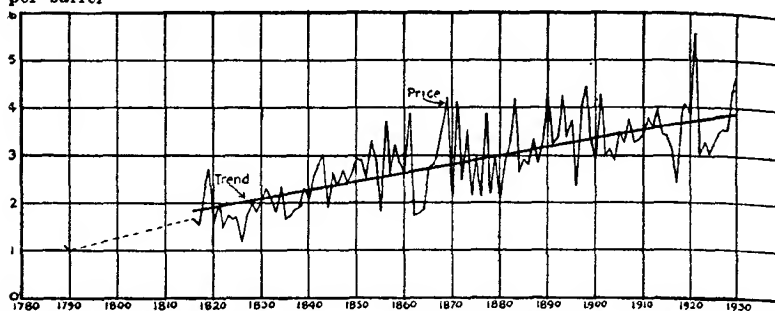


Figure 2. When apple prices have been adjusted for variations in the purchasing power of the dollar, a decided upward trend is evident during the last one hundred years. (Data from Table 1.)

Index Numbers of Apple Prices and Prices of All Farm Products, United States, 1910-1930 1910-14 = 100

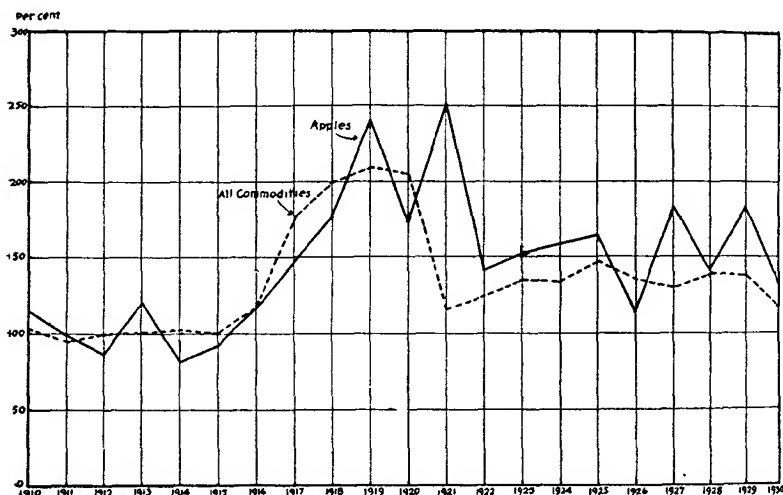


Figure 3. Apple prices have been relatively higher than prices of all agricultural commodities during the period of declining prices since the World War. (Data from Table 2.)

In Figure 3 average prices for the five years just prior to the World War equal 100, and average annual prices were computed to percentages of this base average. The curves indicate prices in various years as compared with the five years just before the War.

Comparative prices of Baldwin apples in Boston and prices of apples to Wenatchee-Okanogan growers (Fig. 4) show quite similar variations from year to year.

Weighted Average Prices of Apples to Wenatchee-Okanogan Growers and Prices of Baldwins at Boston

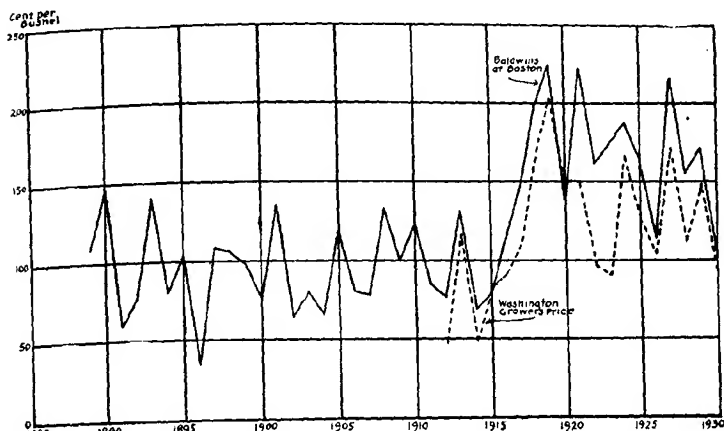


Figure 4. Apple prices at Boston fluctuated similarly to prices received by Washington growers from 1912 to 1930. Previous to 1912 Boston prices fluctuated around the same general level so that the period, 1910-14, is fairly representative of the pre-war price level. (Data from Table 3.)

Although apple prices have fluctuated more widely they have followed closely the general level of prices of all agricultural commodities. Prices of all agricultural commodities rose faster than apple prices during the War period, but during the period from 1920 through 1930, apple prices have been relatively above those of all farm products in all years except 1926.

APPLE PRODUCTION

Total Production. Since 1889 apple crops have ranged from 253 million bushels in 1914 to as low as 80 million in 1890, a variation of 173 million bushels. (Fig. 5). These wide fluctuations in production

Total Production of Apples, United States, 1889-1931

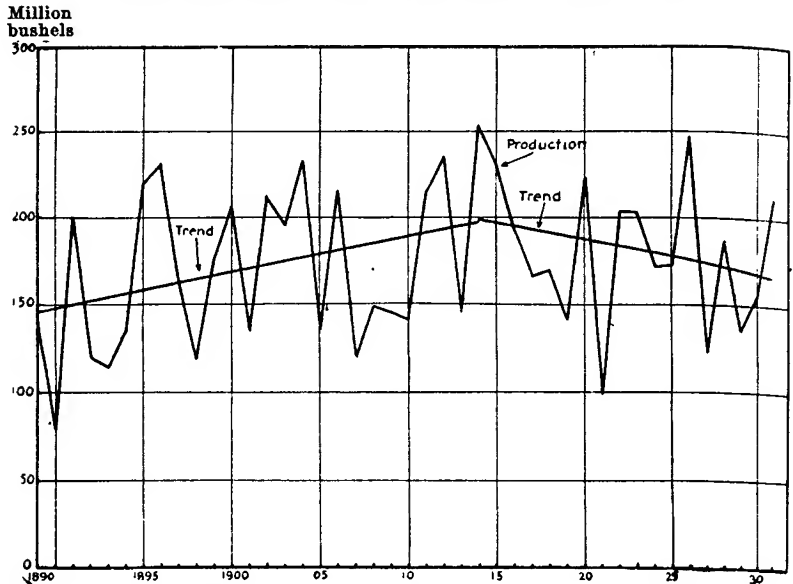


Figure 5. The wide fluctuation in the size of the apple crop from year to year is one of the principal causes of instability in the industry. In spite of these wide fluctuations, the trend of production was upward until 1914 and since then has been decidedly downward. (Data from Table 7.)

are caused chiefly by variations in yield, due to the alternate bearing habit of many varieties of apple trees, and weather and environmental conditions, especially during the blooming period. Apples are borne on fruit spurs which with certain varieties and under many conditions, tend to produce wood growth one year and fruit the next. Since each spur may bear fruit only in alternate years, the entire tree may be thrown into alternate bearing by such disturbances as frosts or the devitalizing effect of very heavy crops. The readiness with which this may occur varies with the variety and the cultural practices followed. This variation in production causes serious difficulties in the market distribution of the crop, makes apple growing a less certain enterprise, and in some sections of the country even forces growers to supplement apple raising with the production of other crops.

Although fluctuations have been wide, the trend of production in the United States was upward until 1914, when the largest apple crop was produced. The five years of largest production were between 1911 and 1915 when the crop averaged 216 million bushels a year. The trend

has been downward since 1914, and during the last five years, 1927 to 1931, production averaged 163 million bushels. During the 16 years between the five years of peak production and the last five years, the apple crop of the United States has decreased at the rate of three million bushels a year or 25 per cent for the period. (Fig. 5).

Production in the Box States¹ has increased since 1889, and during the last five years, 1927 to 1931, averaged 56 million bushels annually or about one-third of the crop of the United States. This was an increase of 156 per cent over the average annual production of 22 million bushels of the Box States between 1911 and 1915. (Fig. 6).

Total Apple Production, Box States and Barrel States, 1889-1931

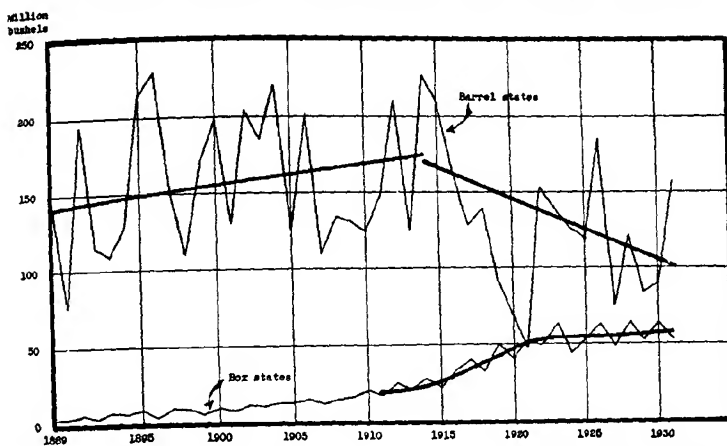


Figure 6. The trend of total apple production in the Barrel States was upward from 1889 to 1914 but has been distinctly downward since. Production in the Box States increased, particularly from 1911 to 1921, and has tended to increase slightly since that time. (Data from Table 7.)

The trend of total production in the Barrel States¹ has been downward since the peak crop in 1914. During the five years of largest production in the Barrel States, 1911 to 1915, the crop averaged 194 million bushels, while during the last five years it averaged 106 million, a decrease of 45 per cent. (Fig. 6).

¹ The Box States consist of the 11 Western States of the United States; the remaining states are called the Barrel States.

Total Production of Apples in Geographic Divisions of the United States 1889-1931 (Figures in vertical columns are million bushels)

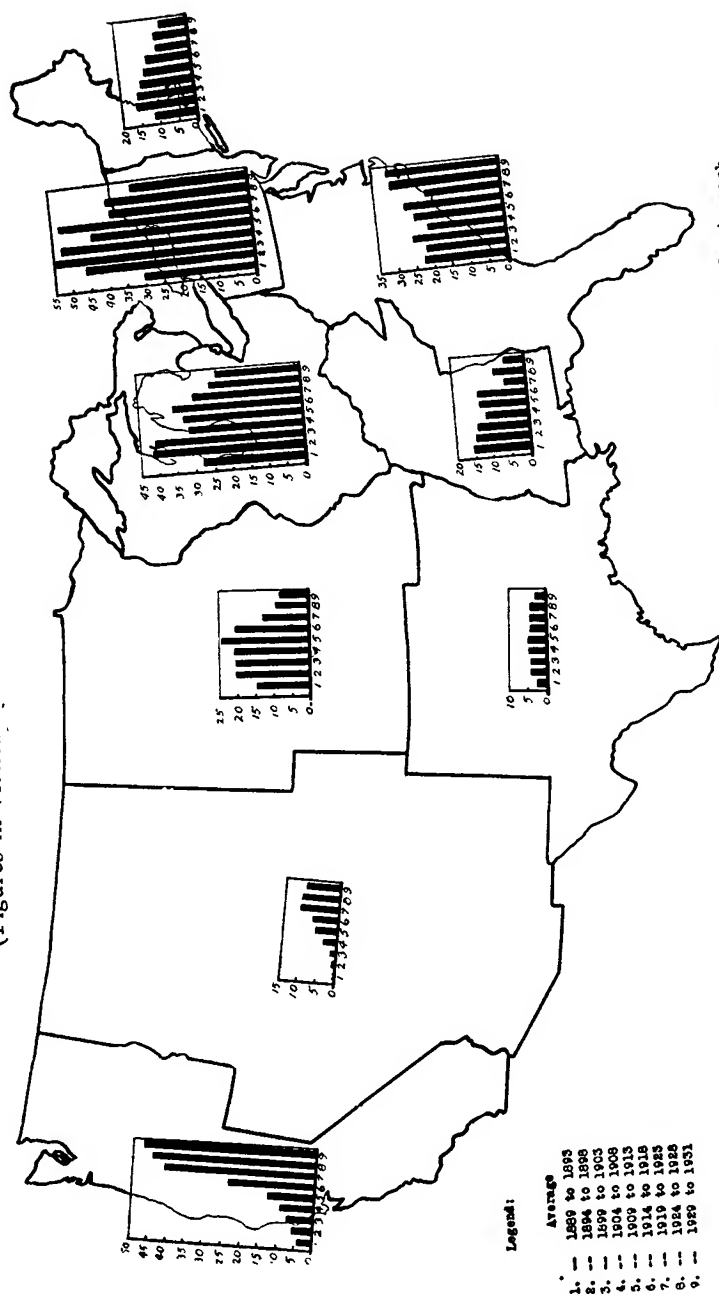


Figure 7. The Pacific States comprise the only group in which the total production of apples in each five-year period exceeded that of the preceding five years since 1889. In other important groups, production is decreasing. Figures in vertical columns on chart represent millions of bushels. Each vertical bar represents average annual production for a five-year period according to the legend (Data from Table 8.)

The average annual production for the five years from 1927 to 1931, and the percentage of the total crop of the United States produced in each of the geographic divisions were as follows:

	Total Production (thousand bushels)	Percentage of United States total crop
United States	162,739	100.0
Barrel States	106,431	65.4
Box States	56,308	34.6
Pacific	46,572	28.6
Middle Atlantic	30,769	18.9
South Atlantic	28,970	17.8
East North Central	21,995	13.5
Mountain	9,736	6.0
West North Central	8,192	5.0
New England	7,899	4.9
East South Central	5,975	3.7
West South Central	2,631	1.6

Average apple production for each five-year period from 1889 to 1928 and the three-year average for 1929 to 1931 are shown in Figure 7. The Pacific States lead all groups in total apple production, exceeding by more than one-half the Middle Atlantic group which is second. These two groups, together with South Atlantic and East North Central, have produced over three-fourths of the United States crop during recent years.

Only in the Pacific States has production increased during each successive five-year period. Although the peak was reached in the late nineties in the Middle Atlantic group, a continued decline did not begin until the 1914-1918 period. A general decline has taken place in all groups except the Pacific and New England, which showed increases during the the last two periods. If present trends continue, the Pacific States will become an even more important factor in the production of the total apple crop of the nation.

Commercial Production. The term "commercial production" indicates the part of the apple crop that is sold for consumption as fresh fruit. In the United States this was increasing at the time of the first records in 1916, although by that time, total production had already passed its peak and was on the decline. The trend of commercial production rose rapidly from 1916 until early in the twenties and continued to increase at a slower rate until the peak commercial crop in 1926. Since 1926, the trend of commercial production appears to have been slightly downward. (Fig. 8).

Commercial Production and Car-lot Shipments of Apples, United States, 1916-1931

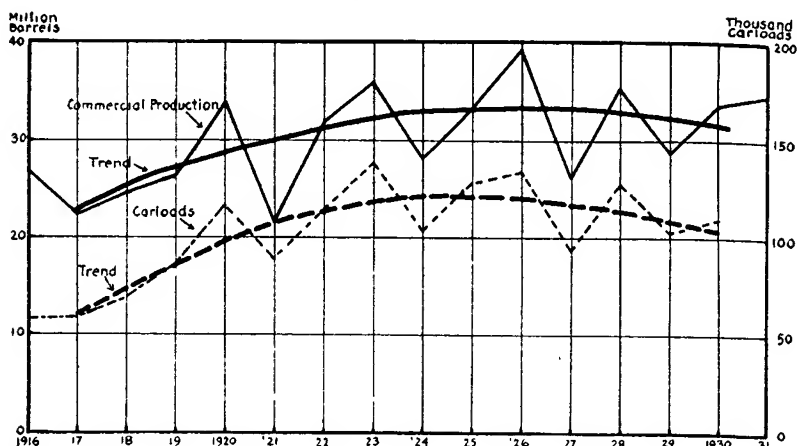


Figure 8. The trend of commercial apple production in the United States rose rapidly to 1926 and since then has been slightly downward; the trend of car-lot shipments increased more rapidly at first but turned downward about 1923 and since then has been distinctly downward. (Data from Tables 10 and 13.)

Average annual commercial production during the five years from 1927 to 1931 and the percentage of the commercial crop of the United States produced in each of the geographic divisions during that time were as follows:

	Commercial Production (thousand bushels)	Percentage of United States commercial production
United States	95,233	100.0
Barrel States	51,292	53.9
Box States	43,941	46.1
Pacific	35,946	37.8
Middle Atlantic	17,427	18.3
South Atlantic	15,190	15.9
East North Central	9,323	9.8
Mountain	7,994	8.4
New England	4,907	5.1
West North Central	2,798	2.9
West South Central	1,198	1.3
East South Central	448	0.5

The Barrel States produced about two-thirds of the commercial crop of the United States between 1916 and 1920, but during the last five years the proportion has declined to 54 per cent. The Box States

now produce about 8 per cent less of the commercial crop than the Barrel States. The trend of commercial production in both Box and Barrel States is shown in Figure 9.

Commercial Apple Production, Box States and Barrel States, 1916-1931 (In barrels)

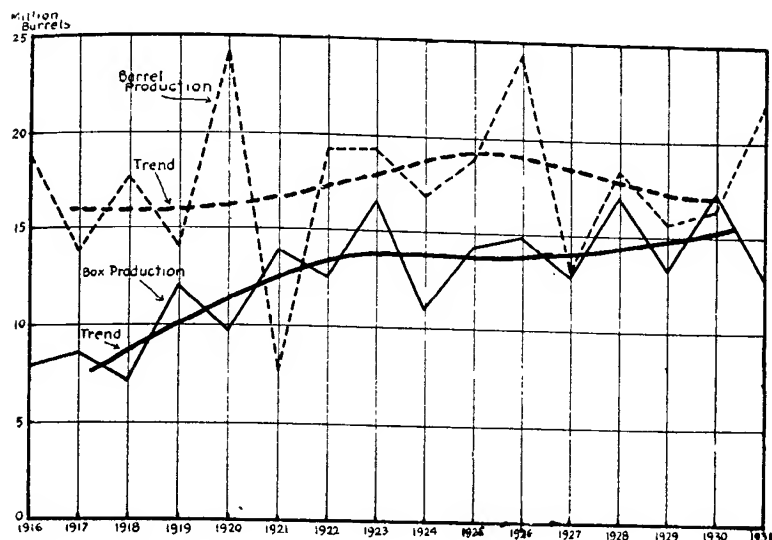


Figure 9. The commercial apple crop of the Box States has been increasing since 1916, while in the Barrel States it has been decreasing somewhat during recent years. One barrel equals three bushels. (Data from Table 10.)

The percentage of the total apple crop that was commercial in each group of states during the five years from 1927 to 1931 was as follows:

	Per cent Commercial
United States	59
Box States	78
Barrel States	48
Mountain	82
Pacific	77
New England	62
Middle Atlantic	57
South Atlantic	52
West South Central	46
East North Central	42
West North Central	34
East South Central	8

Less than one-half of the apple crop of the Barrel States is commercial, as compared with over three-fourths in the Box States. In the New England States, where more of the crop is commercial than in any other group in the Barrel States, 15 per cent less of the crop is commercial than in the Pacific States. These data indicate the large amount of commercialization in the apple industry of the Far West.

Car-lot Shipments. Beginning with the 1916 season, the first crop years for which data are available, car-lot shipments of apples in the United States increased rapidly until 1923, the year of peak shipments, after which they slowly declined. (Fig. 8).

This decline resulted partly from the increase in the use of the motor truck. In 1928 about 24 per cent of the apples reaching the central markets in sample areas studied in the Central Atlantic and East North Central States¹ were shipped to market by motor truck.

Lower freight rates offered by motor trucks for short hauls has increased the advantage of apple growers whose orchards are located at relatively short distances from large population centers. Better highways, together with cheaper and mechanically better trucks, have lowered the costs of many growers. This has increased the competition against boxed apples from the Far West by increasing the freight differential.

Trucking apples to market instead of shipping them by railway has decreased the reliability of carlot shipments as an indicator of the amount of apples reaching markets. Because of the long distance which most of the box apples are shipped, a larger percentage of these are shipped by rail than of the barrel apples. Car-lot shipments are, therefore, more representative for the box crop than for the barrel.

Annual car-lot shipments and the percentage of total apple shipments of the United States originating in the different geographic divisions during the five years from 1926 to 1930 were as follows:

	Carloads	Percentage of United States Shipments
United States	113,353	100.0
Box States	57,154	50.4
Barrel States	56,199	49.6
Pacific	47,030	41.5
South Atlantic	24,403	21.5
Middle Atlantic	17,730	15.6
Mountain	10,124	8.9
East North Central	8,565	7.6
New England	2,261	2.0
West North Central	2,128	1.9
West South Central	921	.8
East South Central	182	.2

¹ United States Department of Agriculture, Edwards, Brice, and Park, J. W.; The Marketing and Distribution of Fruits and Vegetables by Motor Truck, pages 87 and 88.

Car-lot apple shipments from the Box States and the Barrel States are about equal, but the shipments from the Box States are increasing, while those from the Barrel States are decreasing. (Fig. 10).

Car-lot Shipments of Apples, Box States and Barrel States, 1916-1931

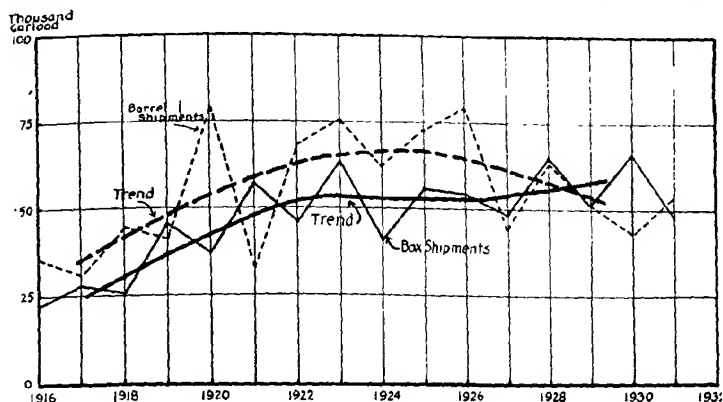


Figure 10. The trend of car-lot shipments of apples from the Box States is still upward while that of the Barrel States is decidedly downward. (Data from Table 13.)

APPLE TREES

Annual variation in apple production is due more to fluctuations in yield per tree from year to year than to variations in the number of bearing trees, which changes slowly. The general level of apple production, however, depends largely on the number of bearing trees, although it is also influenced by the general level of yield per tree. Additional plantings of apple trees are reflected in increases in production from seven to 10 years later. A study of production trends should, therefore, be accompanied by studies of both trends in tree plantings and changes in average yields over a period of years.

Data for the United States on the number of bearing and non-bearing trees are available for each census year since 1910¹. An apple tree survey made by the Bureau of Agricultural Economics of the United States Department of Agriculture furnishes data by variety

¹The method used by the United States Bureau of Census in counting bearing apple trees changed somewhat between 1890 and 1900, while in 1910 more changes took place and the number of trees that had not reached bearing age was also enumerated. Since census data for 1910 and thereafter are more comparable and because of the several changes in schedules made prior to 1910, only the data beginning with that census year are used in this study.

and age groups of trees that were in the commercial orchards of the United States on January 1, 1928.

Bearing and Non-Bearing Trees. The number of bearing and non-bearing apple trees in the United States in each of the census years since 1910 was as follows:

	Bearing (thousand trees)	Non-Bearing (thousand trees)	Total (thousand trees)
1910	151,323	65,792	217,115
1920	115,309	36,195	151,504
1925	103,697	34,299	137,996
1930	88,844	27,452	116,296

Each census year since 1910 has shown a decline in the number of bearing and non-bearing trees in the United States. (Fig. 11). In 1930 there were only a little more than one-half as many bearing trees in the country as there were in 1910, but the decrease was not as rapid between 1920 and 1930 as during the preceding 10 years.

In 1910, 30 per cent of the trees had not reached bearing age. By 1920, although the number of bearing trees had decreased 45 per cent, only 24 per cent of the trees were non-bearing. In 1930, although bearing trees had decreased still further, the proportion of non-bearing trees remained at 24 per cent. The rate of planting, as indicated by the number of non-bearing trees was less than one-half as great just prior to 1930 as it was 20 years before, but the decrease between 1920 and 1930 was not as large as during the 10 years before.

There was a net decrease of 35 million trees in the United States between 1920 and 1930, but even more trees were actually eliminated during this period. In 1920 there were 152 million trees, 36 million of which had not reached bearing age but which would have begun bearing before 1930. Since there were only 89 million bearing trees remaining in 1930, at least 63 million had been eliminated during the 10 years or an average of over six million a year. The actual rate was even larger than this, because trees were counted in 1930 that were planted after the 1920 census was taken but which began to bear before 1930. Actual eliminations probably were between 65 and 70 million during the 10 years as compared with a net decrease of only 35 million.

The number of trees in the Box States in the census years since 1910 was as follows:

	Bearing (thousand trees)	Non-Bearing (thousand trees)	Total (thousand trees)
1910	12,137	14,837	26,974
1920	21,203	3,124	24,327
1925	18,272	2,674	20,946
1930	13,367	2,076	15,443

The number of bearing trees in the Box States increased 79 per cent between 1910 and 1920 but has declined since 1920. (Fig. 11). In 1930 there were 10 per cent more bearing trees than in 1910 but 37 per cent less than in 1920. About 55 per cent of the trees in these states in 1910 had not attained bearing age but in 1920 the proportion had declined to 13 per cent, while in 1930, 13 per cent were still non-bearing, although the number of bearing trees had decreased 37 per cent. The planting rate just before 1920, therefore, had declined to about one-fifth of the high rate during the years immediately preceding 1910, but since 1920 the decline has been more moderate. The elimination of trees from the orchards of the Box States amounted to at least 11 million between 1920 and 1930 as compared to a net decrease of 9 million trees.

The number of apple trees in the Barrel States in the census years since 1910 was as follows:

	Bearing (thousand trees)	Non-Bearing (thousand trees)	Total (thousand trees)
1910	139,186	50,955	190,141
1920	94,107	33,071	127,178
1925	85,425	31,625	117,050
1930	75,477	25,375	100,852

There were 64 million less bearing trees in 1930 than in 1910. The decrease, however, was less than one-half as great between 1920 and 1930 as during the preceding 10 years. (Fig. 11). The Barrel States had 92 per cent of the bearing trees of the United States in 1910, while in 1930 they had 85 per cent. Although there were only one-half as many non-bearing trees in 1930 as in 1910, the proportion of non-bearing trees had decreased only from 27 per cent to 25 per cent. The elimination from the orchards in the Barrel States between 1920 and 1930 amounted to at least 52 million trees as compared to a net decrease of 26 million in the total number of trees during the same period.

Yield Per Tree. Approximate average yields per tree may be computed by dividing the number of bearing trees as shown by the United States census data into the average annual total production for the five years centered at the census year. Approximate average yields per tree for the United States, Box States, and Barrel States were as follows:

	1907-11 (Bu.)	1917-21 (Bu.)	1922-26 (Bu.)	1927-31 (Bu.)
United States	1.02	1.39	1.32	1.33
Box States	1.25	2.03	3.00	4.21
Barrel States	1.00	1.24	1.69	1.41

Number of Bearing and Non-Bearing Apple Trees, United States, Box States, and Barrel States, 1910, 1920, 1925, and 1930

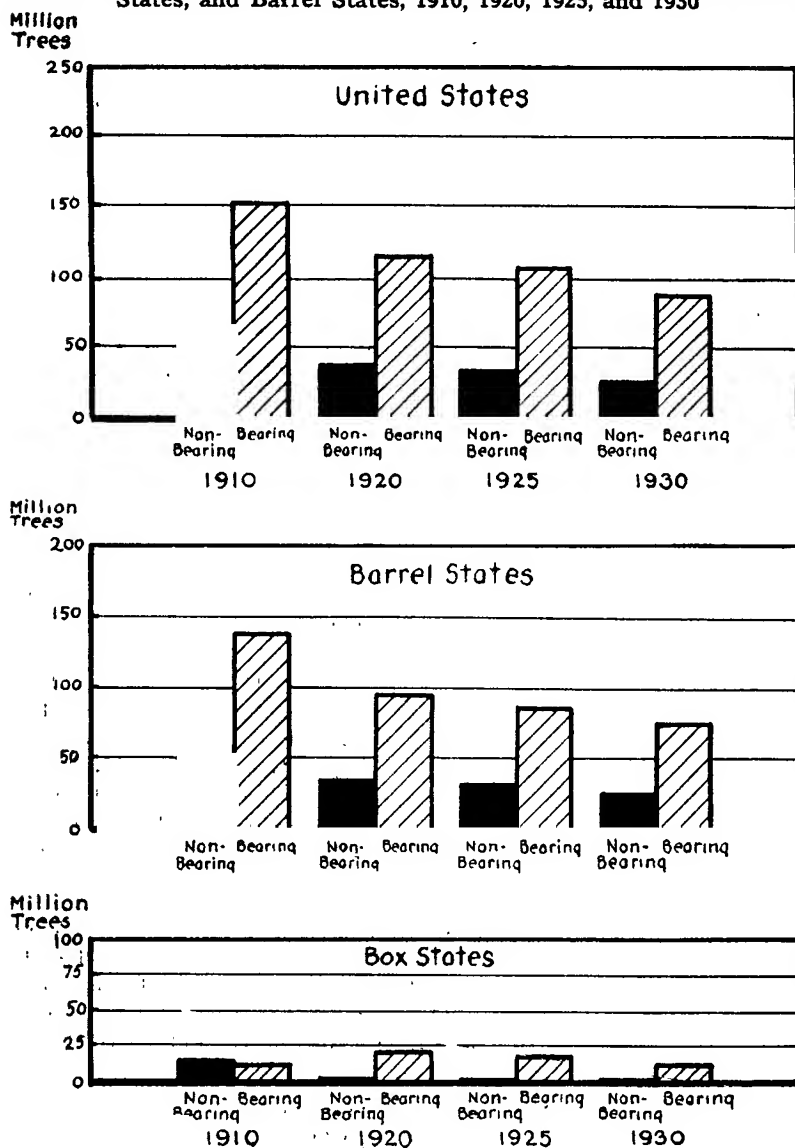


Figure 11. Both bearing and non-bearing trees have been decreasing in the United States since 1910. In the Barrel States they have decreased since 1910 and in the Box States since 1920. (Data from Table 19.)

During the five crop years from 1907 to 1911, the apple yield in the United States averaged approximately one bushel per tree. From 1927 to 1931, 20 years later, the average yield had increased to 1.8 bushels per tree. While the actual increase amounted to only 0.8 of a bushel per tree, it represented a rate of increase of 80 per cent. The increase in yield per tree has tended to offset the decrease in the number of bearing trees.

During the same time the approximate average yield per tree in the Barrel States increased from one bushel to 1.4 bushels per tree or 40 per cent. This was only one-half the increase of the entire United States. During the period from 1907 to 1911 the approximate average yield in the Box States was 1.25 bushels per tree, while 20 years later it had increased to 4.21 bushels per tree, an increase of almost three bushels. The yield per tree in the Box States during recent years has been more than double the average for the United States, and three times that of the Barrel States. The increased yields explain why production in the Box States has continued to increase rapidly even though the number of bearing trees has decreased.

The general increase in yield throughout the United States has been accomplished by the elimination of poorer orchards and by the use of more scientific cultural practices. In the Far West, trees have also been removed from commercial orchards to give more space to those remaining. High yields not only increase the gross income of an orchard but generally reduce unit costs by furnishing a larger amount of product over which fixed charges can be spread. If not attained at too great an expense, high yields are, therefore, of double advantage to the individual grower. The higher yields obtained in the Far Western States partly explain why growers of boxed apples have been able to compete successfully with barrel apple growers even though distance to market and resulting freight rates greatly favor the barreled apples.

Age of Trees. The apple tree survey of the Bureau of Agricultural Economics indicates the planting dates of trees found in the commercial orchards of the United States on January 1, 1928. Since this does not take into consideration the trees that had been removed prior to 1928, these data furnish only a rough indication of annual apple tree plantings. They show, however, the ages of trees by five-year periods that were producing the commercial apple crop in 1928.

There were 81 million trees in the commercial apple orchards of the United States on January 1, 1928. While not exact, a fairly definite idea of the maturity of apple trees is given by the following grouping: (1) Trees that have not attained an age when they would bear in commercial quantities but including those which have just begun to bear, 8 years and younger, (2) trees in early bearing, 9 to 18 years of age,

(3) trees of mid-bearing age, 19 to 28 years, and (4) old trees, 29 years of age and older.

The yield of trees frequently declines after about 30 years of age in the irrigated areas of the Far West. Trees of this age are not generally considered old in all sections of the country, but they have usually passed their prime.

During the early bearing period for about 10 or 12 years after commercial bearing begins, yields ordinarily increase rapidly and color and quality are relatively more easily obtained than later when the trees have become larger and often crowded. This is probably the period of most economical production in the life of an apple orchard. The length of the period is not distinct but varies with cultural practices and other factors that influence the growth and fruitfulness of the trees. In general this period extends from about 8 or 9 years of age to about 18 or 20 years.

The percentage of the apple trees of the United States, the Box States, and the Barrel States falling into each of these groups in 1928 was as follows:

Age	United States	Box States	Barrel States
	%	%	%
1. Young trees (8 years old and younger)	27.7	12.9	31.2
2. Early bearing (9 to 18 years of age)	38.2	54.7	34.3
3. Mid-bearing age (19 to 28 years of age)	22.1	26.7	21.0
4. Old trees (29 years old and older)	12.0	5.7	13.5
All Ages	100.0	100.0	100.0

Nearly two-thirds of the apple trees in the commercial orchards of the United States in 1928 had either not attained bearing age or were in the first 10 or 12 years of their commercial bearing life and should continue for some time to increase in yield per tree. Only about one-third of the trees had attained mid-bearing age or were old trees. A tendency toward increased yield per tree may be expected during the next few years, unless other conditions such as care of trees, orchard abandonment, or weather conditions should change materially.

About 16 million or 19 per cent of the trees were in the Box States in 1928. Since over one-half of the trees were in the early bearing period, and only 13 per cent were young trees under 9 years of age in 1928, the proportion of the trees passing through the early bearing period may be expected to decline materially during the next few years. (Fig. 12).

Estimated Number of Apple Trees of Various Ages in Commercial Orchards, United States, Box States, and Barrel States on Jan. 1, 1928

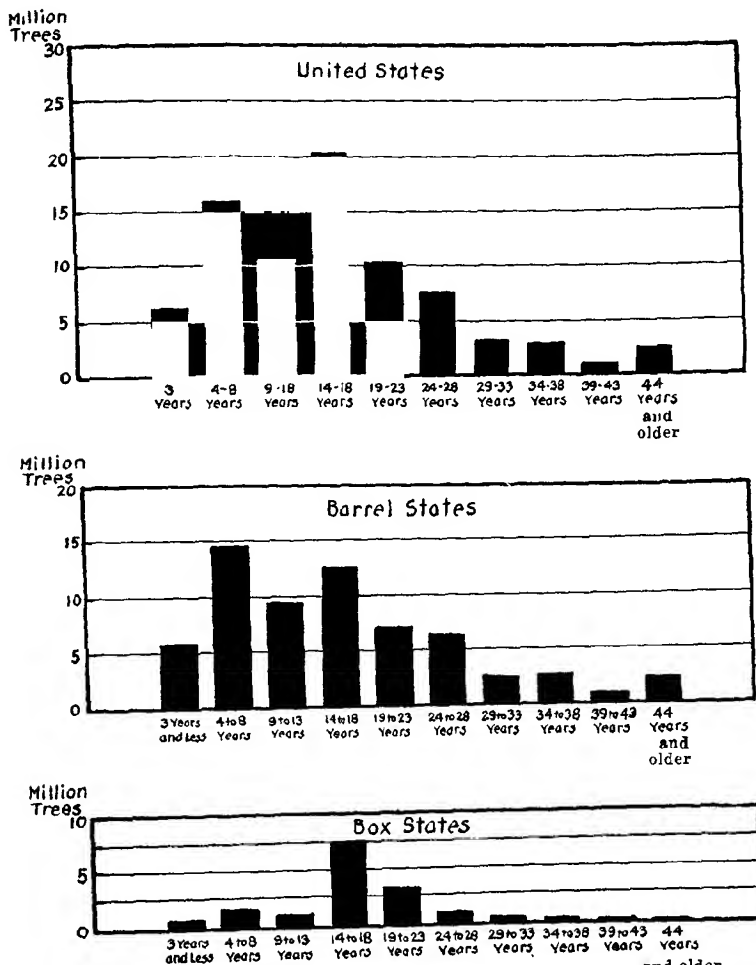


Figure 12. There were more apple trees between 14 and 18 years of age than in any other age group in the United States. The same is true of the Box States, but in the Barrel States, more trees were between 4 and 8 years of age, indicating much heavier planting in the Barrel States during recent years. (Data from Table 21.)

Apple tree planting in the Box States between 1920 and 1927 averaged only about one-fourth of a million a year or 1.8 per cent of the number of commercial bearing trees in 1928. This is not sufficient to maintain the number of bearing trees of that year. The number of trees passing through the period of rapidly increasing yields will probably decline during the next few years. The rate of planting is insufficient to maintain the number of bearing trees. Unless planting has increased materially since 1928, it does not appear probable, therefore, that production in the Box States will continue to increase as rapidly in the next few years as it has during the last 10 or 15 years.

About 65 million, or 81 per cent, of the trees in the commercial orchards of the United States in 1928 were in the Barrel States. In these states, recent planting rates have been much heavier than in the Box area. Almost two-thirds of the trees had not reached 19 years of age in 1928, and about as many were young as in the early bearing period. The proportion of trees passing through the period of rapidly increasing yields will remain about the same during the next few years, while the number of trees coming into commercial bearing will increase.

The number of bearing trees may increase, and if average yields increase or even remain about the same, the decrease in production of these states may be checked.

The number of trees passing through the early bearing period will be much smaller in the Box States but about the same in the Barrel States during the next few years. The advantage to box apple growers which may have been caused by the large proportion of the trees passing through this period during recent years will be appreciably reduced during the next few years.

Varieties. Sixteen varieties accounted for 73 per cent of the apple trees in the commercial orchards of the United States in 1928, according to the survey of the Bureau of Agricultural Economics, although hundreds of varieties were found, (Fig. 13).

Delicious, Winesap, and Jonathan, which have been widely planted in both Box and Barrel areas, are the three principal varieties and accounted for nearly one-fourth of the total number of trees. These varieties together with Baldwin and Stayman represented 38 per cent of the total.

There are fewer varieties to be found in the Box States, the five most important of which represented two-thirds of the total number of trees, while in the Barrel States, the five principal varieties accounted for only a little over one-third of the total.

There were 6.8 million **Delicious** trees in the commercial orchards of the United States in 1928 of which 27 per cent were in the Box

Estimated Number of Apple Trees of 16 Important Varieties in Commercial Orchards of the United States, January 1, 1928

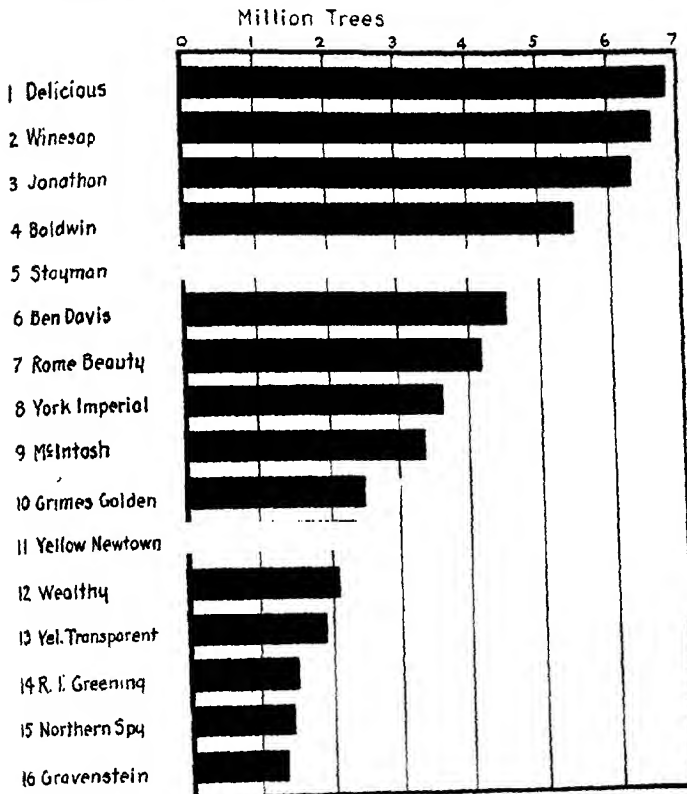
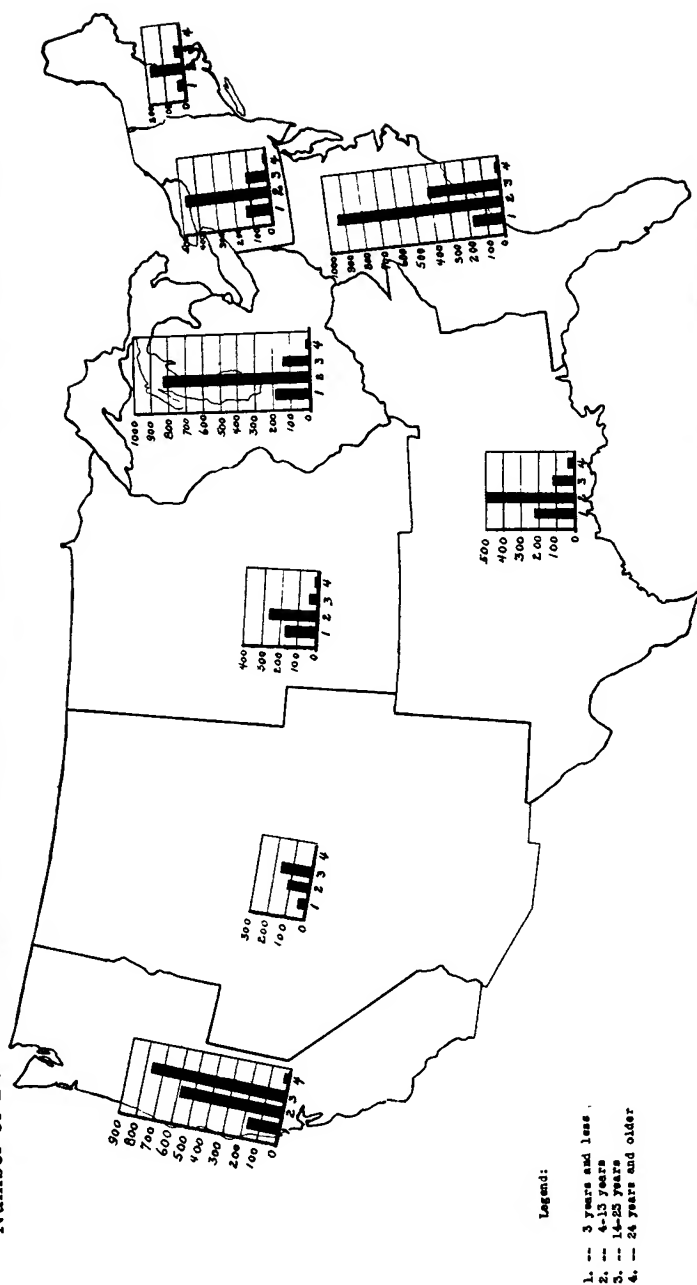


Figure 13. There were more Delicious trees than of any other variety in 1928 but not many more than Winesap or Jonathon. (Data from Table 26.)

States. The percentage of the Delicious trees of various ages in the United States, the Box States, and the Barrel States in 1928 was as follows:

	United States %	Box States %	Barrel States %
3 years or less	16.2	11.9	17.9
4 to 13 years	56.9	37.1	64.3
14 to 23 years	25.5	49.7	16.3
24 years and older	1.4	1.3	1.5
All Ages	100.0	100.0	100.0

Number of Delicious Trees of Various Ages in Different Sections of the United States, January 1, 1928



About 16 per cent of the Delicious trees in the United States were under four years of age in 1928. This indicated a heavy rate of planting just prior to that year which appears to be considerably more than enough to maintain the number of trees of that variety.

Nearly all of the Delicious trees were under 24 years of age in 1928. About one-fourth were between 14 and 23 years of age in that year, while over one-half were between 4 and 13 years. Recently more trees of this variety have been entering the early bearing period than have been completing it and over one-half of the trees are now in that period of life. Since plantings have been heavy and so large a percentage of the trees is passing through the period of rapidly increasing yields, it appears that the size of the Delicious crop of the United States will increase rapidly during the next few years, probably more rapidly than it has during recent years.

Originally Delicious were planted heavier in the Far West than in the Barrel States, and in 1928 there were more trees of this variety 14 years or older in the Box States than in the Barrel States. During more recent years, planting has been much heavier in the Barrel States which had over four times as many Delicious trees under 14 years of age in 1928 as there were in the Box States and over two and one-half times as many of all ages. Delicious production will increase more rapidly in the Barrel States than in the Box States during the next few years, even though average yields are heavier in the Box States.

In the Mountain States, West North Central, and South Central States, the rate of planting Delicious trees between 1925 and 1927 exceeded the rate during the preceding 10 years. (Fig. 14). In the Pacific States, the rate remained about the same, but in the remainder of the United States it decreased. In the Middle Atlantic and New England States, McIntosh, which is one of the higher-priced varieties, has been planted heavier than Delicious for many years.

There were 6.6 million Winesap trees in the United States in 1928 as compared with 6.8 million Delicious trees, but there were only about one-half as many Winesap less than 14 years of age as there were Delicious of that age. About 37 per cent of the Winesap trees were in the Box States.

The percentage of the Winesap trees of various ages in the United States, the Box States, and the Barrel States in 1928 was as follows:

	United States %	Box States %	Barrel States %
3 years or less	6.1	4.3	7.2
4 to 13 years	33.7	14.4	45.4
14 to 23 years	48.2	76.9	30.9
24 years and older	12.0	4.4	16.5
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All Ages	100.0	100.0	100.0

Number of Winesap Trees of Various Ages in Different Sections of the United States, January 1, 1928

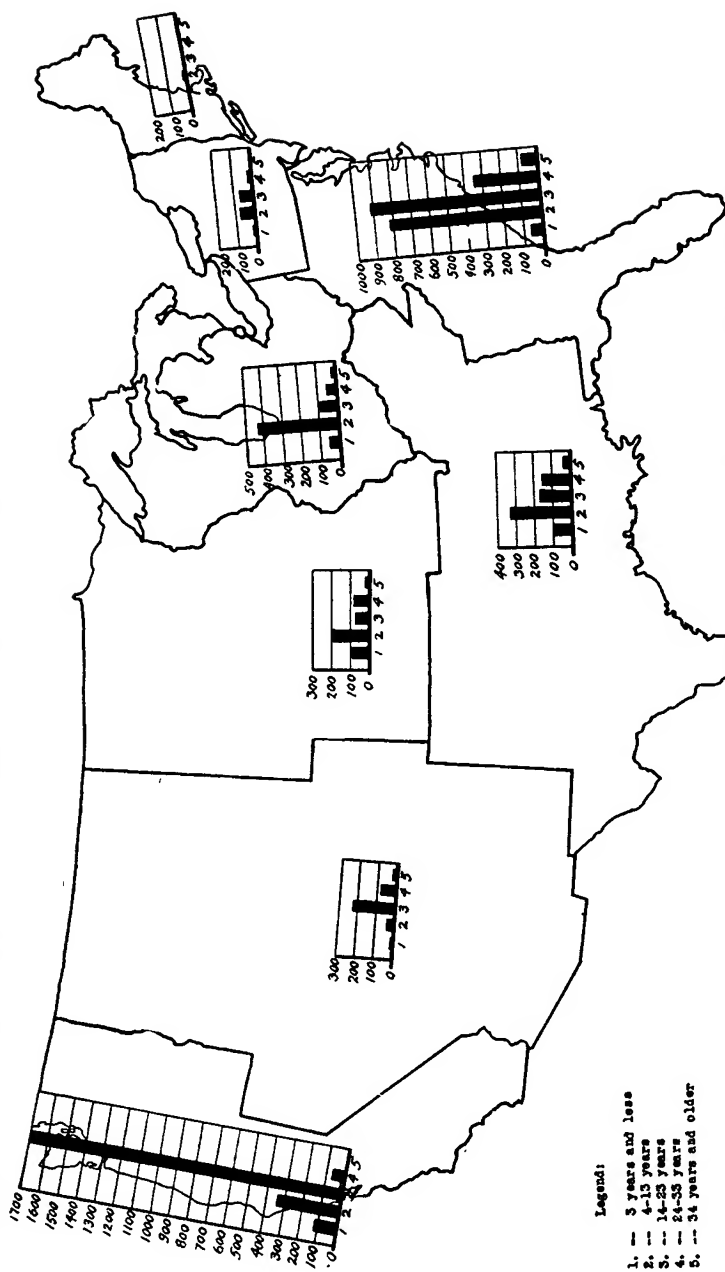


Figure 15. Winesap plantings have been more extensive in the Pacific and South Atlantic States where two-thirds of the Winesap trees were located. Heavier recent plantings have been taking place in the South Atlantic, East North Central, and East South Central States. Figures in vertical columns represent thousands of trees. The figures 1, 2, 3, 4, and 5 refer to the various age groups according to the legend. (Data from Tables 28, 29, and 30.)

About 88 per cent of the Winesap trees in the United States were less than 24 years of age in 1928. Only 6 per cent of the trees were less than four years of age, indicating that the rate of planting just prior to 1928 was hardly sufficient to maintain the number of trees. Since about one-third of the Winesap trees were between 4 and 13 years of age and nearly one-half were between 14 and 23 years in 1928, the proportion of the trees passing through the early bearing period is now decreasing somewhat. The size of the Winesap crop may be expected to continue to increase during the next few years, but the increase will probably not be as rapid as during recent years.

The Box States had a few more Winesap trees 14 years of age or older than the Barrel States, but there were over four times as many under 14 years of age in the Barrel States and nearly twice as many of all ages. The Winesap crop of the Barrel States may be expected to increase rapidly during the next few years, but the increase will not equal that of Delicious. The Winesap production will continue to come largely from the Pacific and the South Atlantic States where most of the trees are located (Fig. 15).

There were 6.3 million **Jonathan** trees in the commercial orchards of the United States in 1928 of which 37 per cent were in the Box States. The percentage of Jonathan trees of various ages in the United States, Box States, and Barrel States in 1928 was as follows:

	United States %	Box States %	Barrel States %
3 years or less	7.9	0.8	12.1
4 to 13 years	34.3	9.7	48.7
14 to 23 years	45.5	83.5	23.2
24 years and older	12.3	6.0	16.0
All Ages	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

About 88 per cent of the Jonathan trees of the United States were under 24 years of age. About 8 per cent of the trees were less than four years of age, and 96 per cent of these were in the Barrel States. The planting rate in the Barrel area seems to be sufficient to increase the number of bearing trees considerably during the next few years, but in the Box States, it is not enough to maintain the present number of bearing trees.

Since about 46 per cent of the Jonathan trees in the United States were between 14 and 23 years of age in 1928, while 34 per cent were between 4 and 13 years, the number of trees passing through the early bearing period is decreasing somewhat, but Jonathan production will probably continue to increase, although more moderately.

Whereas the Box States had more Jonathan trees 14 years of age or older than the Barrel States, there were about 10 times as many

Number of Jonathan Trees of Various Ages in Different Sections of the United States, January 1, 1928

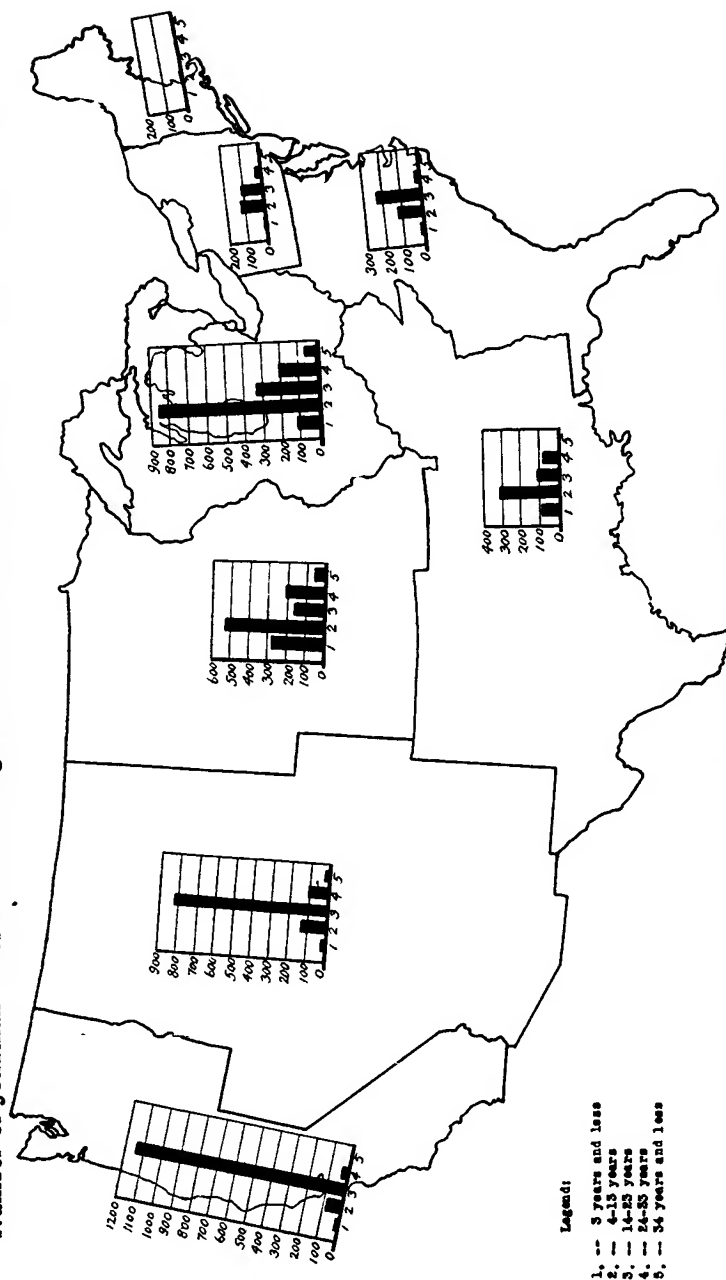


Figure 16. There are more Jonathan trees in the Pacific, Mountain, East North Central, and West North Central than other groups. The trees in the East North Central and West North Central States are younger than those in the Box States. Figures in vertical columns represent thousands of trees. sent thousands of trees. The figures 1, 2, 3, and 4 represent various age groups (see legend). (From Tables 28, 29, and 30.)

under 14 years of age in the Barrel States. Only 10.5 per cent of the Jonathan trees in the Box States were under 14 years old, while over 60 per cent of those in the Barrel States were of the same age. These facts seem to indicate little, if any, increase in Jonathan production in the Box States but continued increase in the Barrel States during the next few years. Jonathan production may be expected to increase most rapidly in the East North Central States (Fig. 16).

There were 4.2 million **Rome Beauty** trees in the United States in 1928, 40 per cent of which were in the Box States, Rome Beauty is the leading variety in Ohio which has more trees of this variety than any other state. Washington ranks second, but here Rome Beauty is only the fourth variety of importance. The percentage of Rome Beauty trees of various ages in the United States, Box States, and Barrel States in 1928 was as follows:

	United States %	Box States %	Barrel States %
3 years and less	6.0	2.4	8.4
4 to 13 years	30.6	12.8	42.9
14 to 23 years	53.9	81.3	35.0
24 years and older	9.5	3.5	13.7
All Ages	100.0	100.0	100.0

Over 90 per cent of the Rome Beauty trees in the United States were under 24 years of age in 1928. About 6 per cent of the trees of this variety were under four years of age in 1928 which indicates a planting rate hardly sufficient to maintain the present number of bearing trees. Plantings were much heavier in the Barrel States than in the Box States.

As a little over one-half of the Rome Beauty trees in the United States were between 14 and 23 years of age and a little less than one-third were between 4 and 13 years old in 1928, the number of trees passing through the early bearing period is decreasing. If conditions remain substantially the same as during recent years, production of this variety may increase moderately, the increase taking place largely in the Barrel area since its trees are relatively younger than those in the Box States. Rome Beauty production in the Far West will probably not increase appreciably and may even decline if plantings in this area do not increase.

There were 2.3 million **Yellow Newtown** or **Albemarle Pippin** trees in the United States in 1928 of which 83 per cent were in the Box States and about 16 per cent were in Virginia. The percentage

of Yellow Newtown trees of different ages in the United States in 1928 was as follows:

	United States %
3 years and younger	1.3
4 to 13 years	6.4
14 to 23 years	55.9
24 to 33 years	25.0
34 years and older	11.4
	<hr/>
All Ages	100.0

Recent plantings of this variety have been very light, and since, in addition over 90 per cent of the trees were 18 years of age or older in 1932, the Yellow Newtown production of the United States will probably not increase during the next few years, and some decrease may be expected, particularly if many trees are eliminated from production.

McIntosh is second in importance in the Middle Atlantic and New England States where three-quarters of the McIntosh trees of the United States are located. The section of next importance is the Mountain States where McIntosh is the third variety of importance, but nearly all of the McIntosh trees in this area are in Montana where the variety represents 85 per cent of the trees. New York, New England, and Montana combined have 88 per cent of the McIntosh trees in the United States.

Recent plantings of McIntosh in Montana have not been as heavy as they were 10 or 15 years ago. In New York about one-quarter of the McIntosh trees were between 14 and 23 years old, while almost three-quarters were less than 14 years of age in 1928. In the New England States, 28 per cent were between 14 and 23 years of age while over two-thirds were under 14 years of age. Although Montana is the largest McIntosh producing state in the Far West, it is much less important than New York or the New England States. The relative importance of the states in northeastern United States in McIntosh production will increase in the near future, since they have nearly all of the young McIntosh trees. Delicious is of less importance in these states.

Although **Baldwin** is easily the leading variety in the Middle Atlantic and New England states, it is of little importance elsewhere in the United States. With the exception of the East North Central States, there were not 100,000 trees of this variety in any other geographic division in 1928. The Baldwin trees are relatively old; more than three-fourths were over 23 years of age and over one-half were more than 33 years old.

Baldwin, Ben Davis, York Imperial, Yellow Newtown, Wealthy, Rhode Island Greening, and Northern Spy have a relatively large percentage of trees that are 25 years of age and older. Declining production of these varieties during the next few years may be expected.

Fresh Apple Exports, United States, 1889-1931

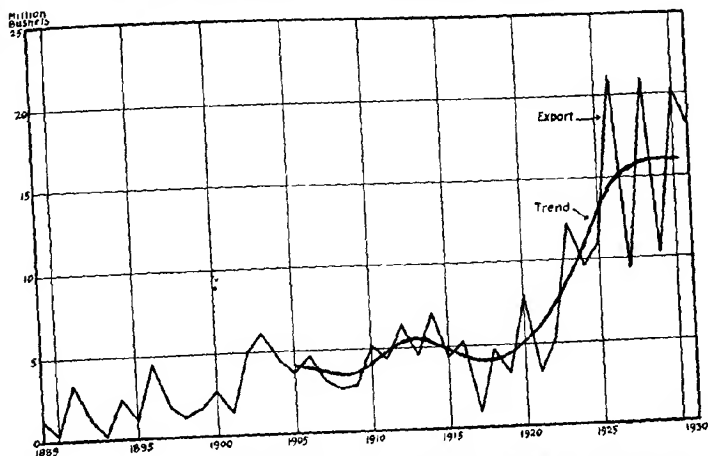


Figure 17. Apple exports decreased during the World War, after which they increased rapidly until 1926. During the last five or six years they have failed to increase appreciably, the trend remaining practically on a level during this time. (Data from Table 4.)

APPLE EXPORTS

Apple exports fluctuate widely from year to year. (Fig. 17). When the crop is large, exports are usually large, and when a small crop is produced, exports usually decline. The long-time trend of apple exports, however, is not similar to that of total apple production, for while the trend of total production has been downward since 1914, the trend of apple exports after the War was decidedly upward until recently.

From 1890 to the beginning of the World War in 1914, the trend of fresh apple exports was gradually upward. During the War, apple exports declined, but beginning with the low point in 1917, they increased rapidly until 1926. Since 1926 the rapid increase has been checked. Exports for the crop years from 1926 to 1930 were about three times as great as those during 1910 to 1914 and were over four

times the low level of the War period, 1915 to 1919. Exports in 1931 were less than in 1930.

During the five years from 1926 to 1930 an average of 17 per cent of the commercial apple crop of the United States was exported. About 86 per cent of the exports went to Europe, five per cent to Brazil and Argentina, nearly five per cent to Canada, and about four per cent to the rest of the world. The United Kingdom has been by far the best foreign customer for American apples and has taken about 51 per cent of the fresh apple exports while Germany took 15 per cent and the Scandinavian countries 6 per cent.

The part of the apple crop that is exported has a strong influence on the apple prices received by growers; if domestic markets had been forced to absorb the additional 17 per cent of the crop that has been exported during recent years, apple prices would undoubtedly have been on a lower level. Apple growers, therefore, should be deeply interested in factors that influence the foreign trade of the United States in apples. The economic conditions that influence trade with Great Britain and Continental Europe are of particular importance.

The large amount of unemployment caused by the world-wide depression has decreased the buying power of workers all over the world. People have had less money to spend for apples than formerly. In the countries whose currencies have depreciated, prices of American apples in terms of their money have risen. This automatically tends to restrict imports from countries whose currencies have not depreciated.

Some of the countries that ordinarily import large quantities of American apples obtained much of their income from manufacturing. In addition to their depreciated currencies, these countries have lost a large part of their export trade in manufactured goods. Countries that buy more than they sell must settle with gold. These countries have been faced with the necessity of maintaining gold reserves to keep their currencies from further depreciation, and strenuous efforts have been made to stop this outward flow of gold.

Some countries prohibited gold shipments and the supply of foreign exchange became scarce. To assure the importation of only the most necessary products in certain countries such as Germany, Denmark, and Argentina, the governments supervised the sale of foreign exchange and limited the amount available for apple imports. In Greece no foreign exchange was allowed for apple purchases from the United States because American apples were considered a luxury.

In their strenuous efforts to produce as much of their food supply as possible, many countries have subsidized agricultural production. This governmental aid is usually accompanied by tariff increases. The

apple industry, as well as other agricultural industries, receives subsidies in some countries. The Chilean government, for instance, pays a direct bounty on apple exports and gives growers material financial aid in planting apple trees. Germany, Switzerland, and Roumania have given governmental aid of one kind or another to their fruit growers. In some countries such as Sweden and Norway, apple imports are either forbidden or tariffs are raised to prohibitive heights during the fall and early winter months, while domestic apples are on the market. Still other countries such as France and Argentina have instituted stringent restrictions against apple importations; while Japan has a complete embargo against American apples purporting to guard against the introduction of insect pests and fruit diseases.

Great Britain, long on a free trade basis, lately has instituted a tariff against apples from the United States. Other countries, such as Canada and Mexico, have raised existing tariffs on apples, while in some instances trade agreements between countries are working to the disadvantage of our apple exports. The depressing effect on our apple exports caused by these various forms of trade restriction is indicated by the flattening out of the trend of fresh apple exports during the last few years. (Fig. 17).

It appears doubtful whether apple exports can be increased under present conditions, and it will probably be difficult to hold them at their present levels if trade barriers continue to be raised against them. But if the growers of the United States have apples of the highest quality to sell, the export trade should become more satisfactory when world conditions improve notwithstanding the fact that some of the foreign competitors are improving the quality of their product. It may be expected, however, that competition in world apple markets will remain keen and may even increase.

Trade agreements between the United States and countries importing American apples should be of considerable aid to the apple growers of this country.

PRODUCTION OF COMPETING FRUITS

Although apples are largely an autumn and winter food, they are consumed in every month of the year. About 7 per cent of the crop is shipped to market during June, July, and August when summer fruits are abundant. During the fall when large quantities of later fruits are available, 65 per cent of the apple crop is shipped. Part of the heavy fall shipments, however, are stored in or near the central markets for later consumption so that considerably more than the remaining 28 per cent compete with the other fruits for a place in the consumers' diet during the winter and spring. Some of these products compete more directly with apples than others.

**Trends of Apple, Peach, and Grape Production in the United States and
Net Imports of Bananas, 1909-1931**
(Base: Pre-war equals 100)

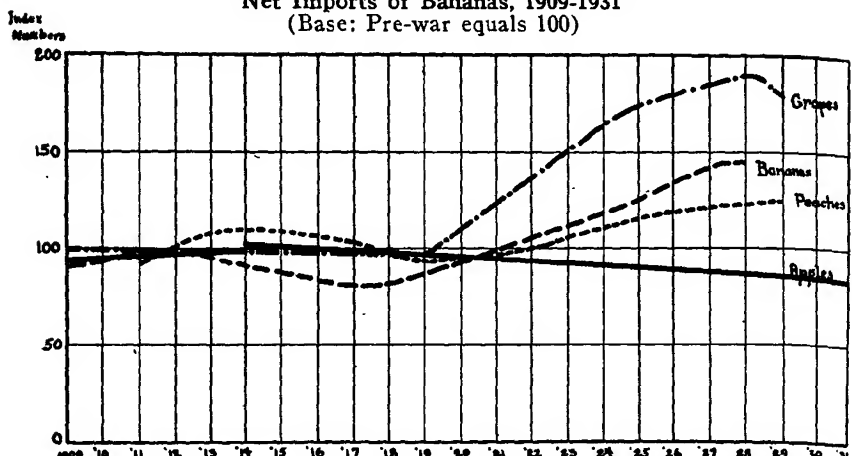


Figure 18. The trend of total apple production has been downward since pre-war years; the trends of peach and grape production and net imports of bananas have been decidedly upward during that time. (Data computed from Table 6.)

There has been a decided increase in the supply of many other fruits during the last 20 years (Figs. 18 and 19). The production of peaches increased since the pre-war period by about 25 per cent and prunes increased nearly 200 per cent. Banana imports increased nearly 50 per cent.

These increases in supply have been accompanied by price declines in some of the products, while the prices of others have been maintained, at least until the period of general price decline following 1929. Where price declines occurred, the greater volume of cheaper fruit materially increased competition against apples. Where prices were maintained, it was accomplished by increasing demand by the use of such methods as intensive advertising campaigns and other forms of sales promotion, and the development of new uses for by-products. In many cases this was accomplished by cooperative marketing organizations that furnished greater selling power and a form of central control for handling marketing problems. These methods have been more widely used in several other fruit industries than in the apple industry.

Exports of most of these fruits other than apples have tended to increase since the pre-war period, but apples meet these products in competition in many markets of the world, notably in the United Kingdom and Continental Europe.

Trends of Apple, Pear, and Orange Production and Output of Dried Prunes in the United States, 1909-1931 (Base: Pre-war equals 100)

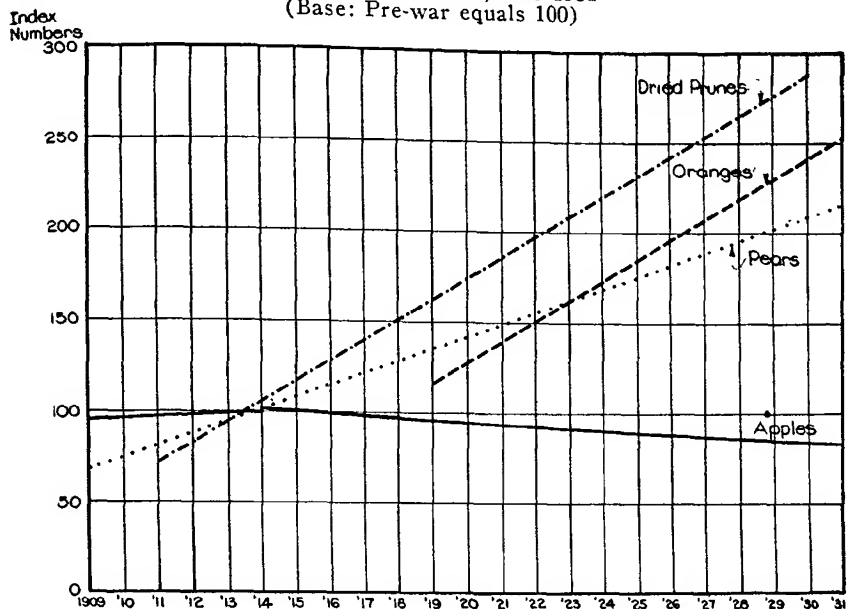


Figure 19. The trends of pear and orange production and dried prune output have been steeply upward during recent years in contrast to a declining trend in total apple production. (Data computed from Table 6.)

APPLES IN WASHINGTON

Production. From 1901 to 1905 the apple crop of Washington averaged only a little over 2 million bushels, or less than 2 per cent of that of the United States, while during the last five years 1927 to 1931, it averaged 31.5 million bushels or 19 per cent of that of the nation. The increase took place slowly during the first 10 years of the period, but beginning about 1910 the increase was more rapid for 10 or 12 years (Fig. 20). Shortly after 1920 the increase slackened for a few years and then rose more sharply again. This represents a sharp contrast to the trend of total production for the United States which has been downward since 1914.

Between 1916 and 1920, 80 per cent of the apple crop of Washington was commercial, while during the last five years the commercial crop was 86 per cent. This compares with 59 per cent for all other states and 64 per cent for the country as a whole during the last five years.

Total Production, Commercial Production and Car-lot Shipments of Apples, Washington, 1930-1931

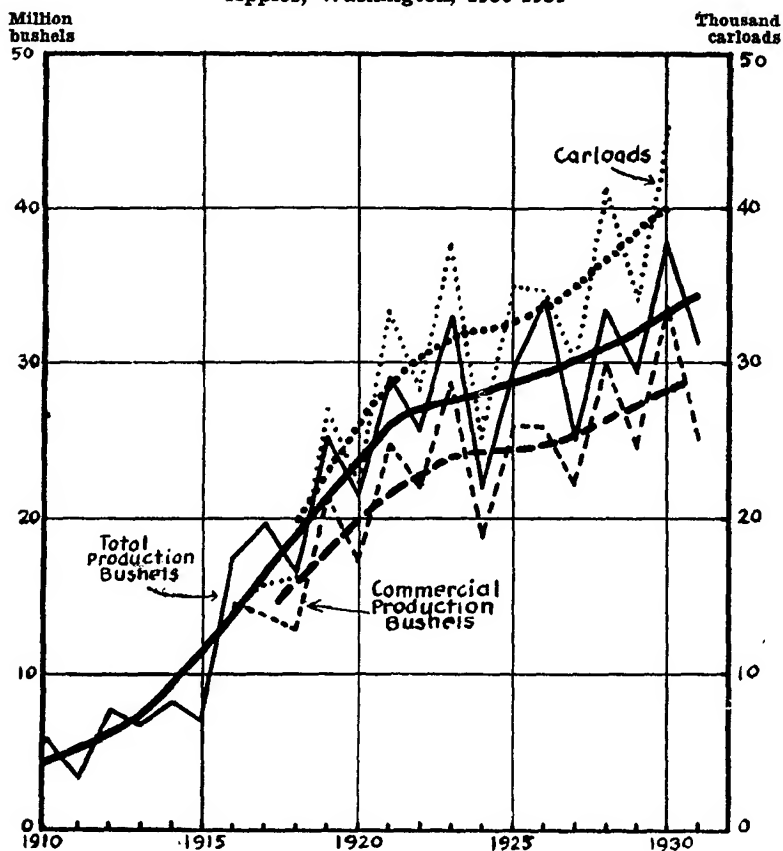


Figure 20. Apple production in Washington increased very rapidly between about 1910 and 1920, but since then the increase has not been so great. All three measures of production are still increasing. (Data from Table 11.)

The trend of commercial production in Washington since 1916 has closely paralleled the total production trend (Fig. 20). Between 1916 and 1920 the state produced 20 per cent of the commercial crop of the United States, while during the last five years it has produced 29 per cent. The trend of car-lot apple shipments from Washington parallels closely those of commercial and total production. During the last five years 33 per cent of the car-lot shipments of the United States have originated in Washington. Car-lot shipments of apples have been

a more reliable indicator of the size of the crop in this state than for the country as a whole because most of the crop must be shipped such a long distance to markets that in most cases motor trucks cannot be used to advantage, and also because most of the fruit shipped by water is first shipped to seaport by rail. Recent highway improvement between Seattle and the Wenatchee-Okanogan and Yakima Districts, however, has resulted in a heavier movement of the crop to the Coast by motor truck.

Bearing and Non-Bearing Trees. The number of apple trees in the state of Washington in the census years beginning with 1910 was as follows:

Census Year	Trees not of bearing age	Trees of bearing age	Total number of trees
1910	4,862,702	3,009,337	7,872,039
1920	755,898	7,964,167	8,720,065
1925	1,049,949	6,781,852	7,831,801
1930	947,986	5,193,571	6,141,557

Heavy plantings in Washington began a few years before 1910 (Fig. 21). In that year there were 7.9 million trees, of which only 38 per cent were bearing trees. For a few years following 1910 heavy plantings continued but decreased sharply before 1920. The heavy plantings just before and immediately following 1910 were reflected in the increase of nearly five million bearing trees in 1920 when the peak of 8 million was reached.

By 1925 the number of bearing trees had decreased 15 per cent, and by 1930 they had decreased to a point 35 per cent below 1920, although there were 73 per cent more than in 1910. About 15 per cent of the trees in 1930 had not attained bearing age (Fig. 21).

The census indicates that there were only 5.2 million bearing trees in 1930, showing that at least 3.5 million trees had been removed from the orchards. This is a conservative estimate, since trees that were planted between 1920 and 1930, but which reached bearing age before 1930, have not been considered.

The rate of tree elimination that will take place in the next few years cannot be estimated with accuracy. As trees grow older, it seems probable that tree removal from crowded orchards will increase, but this type of elimination decreases the total tonnage but little and may even cause some increase. On the other hand, if recent low prices should continue for several years, many of the poorer orchards will be abandoned and many other orchards will probably receive less care. These conditions will tend to retard the increase in production.

**Number of Bearing and Non-Bearing Apple Trees, Washington,
January 1, 1928**

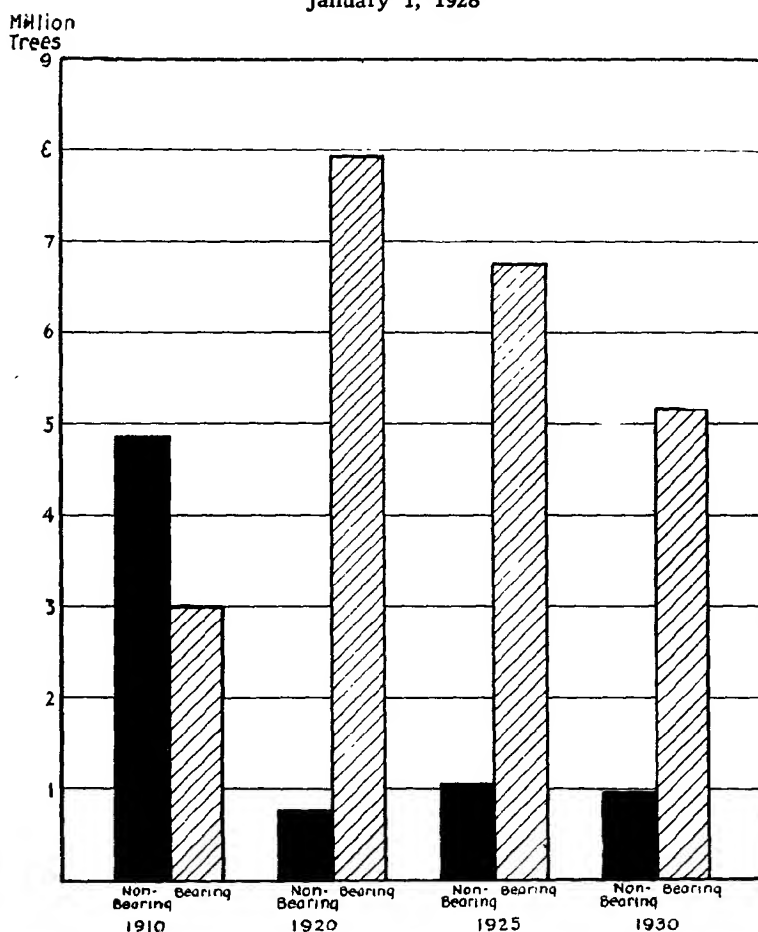


Table 21. The number of bearing apple trees in Washington more than doubled between 1910 and 1920 but since then the number has been decreasing. There were more non-bearing than bearing trees in 1910, but since that year there have been more bearing than non-bearing trees. (Data from Table 20.)

Yield per Tree. Apple yields in the state of Washington have increased as indicated by the following:

	Average bushels per tree
1907-1911	1.3
1917-1921	2.8
1922-1926	4.3
1927-1931	6.1

This large increase in yield per tree is due to improvement in cultural practices, removal of some of the trees from crowded orchards, abandonment of trees in some of the poorer locations, new orchards in more advantageous districts, and a large percentage of the trees passing through the period of early bearing when yield per tree increases most rapidly.

The average yield of 6.1 bushels per tree in Washington is the highest of any state. It compares with an average yield of 1.4 bushels per tree for the Barrel States, and 4.2 bushels per tree for the Box States.

Age of Apple Trees. The Division of Horticulture of the State Department of Agriculture took a census of the fruit trees in Washington for 1931. These data are more accurate for the commercial apple districts than for the district west of the Cascades where few of the orchards are handled on a commercial basis. As this census indicates that 70 per cent of the apple trees were 16 years or older in 1931, it would have been helpful if a classification had been used which would have furnished more detail concerning the ages of this large proportion of the trees (Fig. 22).

The number of trees of various ages in Washington in 1931 and the percentage of the total which they represent, together with the approximate annual planting rate as indicated by this census were as follows:

Age	Years planted	Number of trees	Per cent	Approximate annual plant- ing rate (thous- and trees)
1 and 2 years	1929-1930	390,230	7.4	195
3 and 4 years	1927-1928	295,454	5.6	148
5 to 10 years	1921-1926	708,639	13.4	118
11 to 15 years	1916-1920	208,063	4.0	42
16 years and older	1915 and before	3,675,400	69.6	—
All ages		5,277,786	100.0	—

The approximate average annual planting rate may be obtained by dividing the number of trees planted during a period by the number

Estimated Number of Apple Trees of Various Ages in Washington
in 1928^a and 1931^b

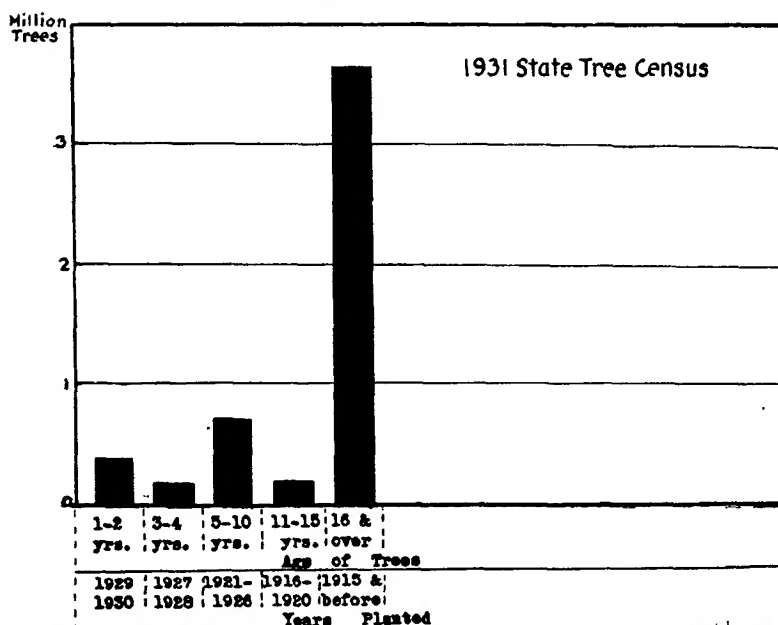
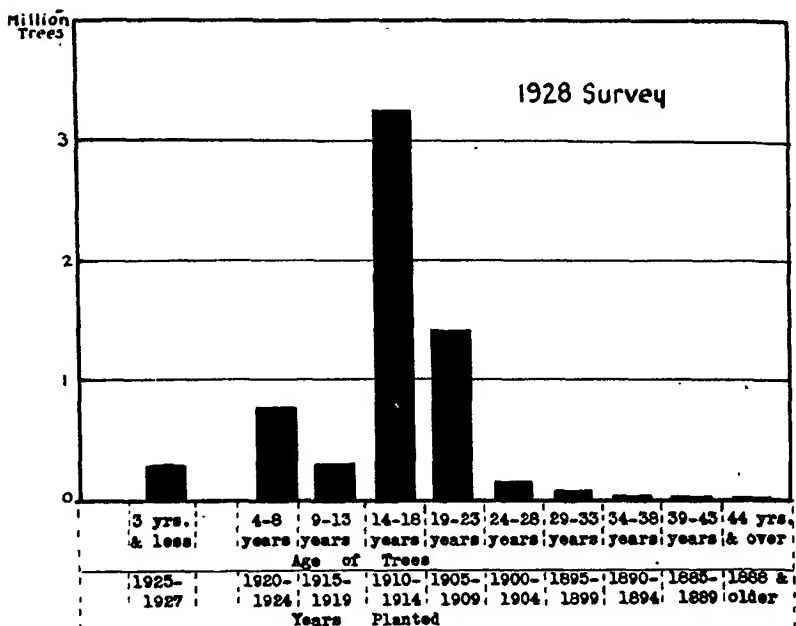


Figure 22. A very large proportion of the apple trees of Washington were planted between 1905 and 1914. The state census in grouping, all trees planted in 1915 and before, omits a great deal of important details.

^a U. S. Dept. of Agri., Y. B., 1931, p. 719.
^b Table 23.

of years in the period.¹ The average annual rate of planting apple trees has been increasing in Washington since 1916 and approximated 195,000 in 1929 and 1930. If it is assumed that an average apple tree begins to bear on a commercial scale about its seventh year, new apple trees are now coming into commercial bearing at the rate of nearly 120,000 a year, while in 1934 and 1935 the annual rate will increase to almost 150,000, and in 1936 and 1937 it will increase further to nearly 200,000 a year. This will have a tendency to increase production during the next few years.

A study of the period before 1916 can be made from the apple tree survey of the United States Bureau of Agricultural Economics. The data from the State Division of Horticulture are the result of a census in which the trees were actually counted, while those from the Bureau are the result of a survey with the figures calculated from representative samples.² Although these two sets of figures are not entirely comparable since they represent different years, they are used to supplement one another.

It is estimated in the survey that on January 1, 1928 there were about 6.4 million apple trees in the commercial orchards of Washington. The number of trees three years of age and younger and in each five-year group to 44 years of age, together with the percentage of the total in each group are as follows:

Age	Years planted	Thousand trees	per cent
3 years and less	1925-1927	318	5.0
4 to 8 years	1920-1924	787	12.4
9 to 13 years	1915-1919	309	4.8
14 to 18 years	1910-1914	3,251	51.1
19 to 23 years	1905-1909	1,434	22.5
24 to 28 years	1900-1904	160	2.5
29 to 33 years	1895-1899	66	1.0
34 to 38 years	1890-1894	23	0.4
39 to 43 years	1885-1889	12	0.2
44 years and older	1884 and before	8	0.1
All ages		6,368	100.0

Very few of the trees were old in 1928 and 96 per cent were less than 24 years of age. About 23 per cent of the trees were between 19 and 23 years old, while nearly one-half were between 14 and 18 years

¹ Because this calculation does not take into account the number of trees that have been eliminated from orchards since the planting dates, it gives only approximate figures, and the longer it has been since they were planted, the more chance there is for inaccuracies. The method is sufficiently accurate to measure recent planting trends, but probably should not be used for periods as long ago as 15 to 20 years.

² United States Department of Agriculture, Estimated Number of Apple Trees by Varieties and Ages in Commercial and Farm Orchards in Washington, Jan. 1, 1928, (Mimeograph). "The figures shown in these tables are estimated totals indicated by the tabulations of the survey data on the assumption that the trees for which reports were received are sufficiently representative to warrant the several computations."

of age. Over three-fourths of the trees, therefore, are now (1932) 18 years of age or older. (Fig. 22).

These ages are significant because the first few years after an orchard comes into commercial bearing are the period when yield increases most rapidly and when quality and color are attained more easily and cheaply. Income increases most rapidly and profits are probably more easily obtained during this period. This is especially true of orchards where the trees have been planted so closely together that they begin to crowd each other before they have obtained full growth.

In Washington the trees in many orchards have been planted too closely together. According to the survey of the Bureau of Agricultural Economics, there was an average of 63.6 apple trees per acre in the commercial orchards in 1928 which would indicate an average planting distance of about 26 feet. Fillers have usually been planted between so-called permanent trees, but growers have often delayed the removal of the fillers until the orchard became too crowded to yield the maximum of high quality fruit. The age at which crowding becomes a limiting factor in apple production varies with such conditions growth, tree spacing, and varieties. As trees become more crowded, yields fail to increase as rapidly and later may even decline, color becomes more difficult to obtain and profits are probably curtailed.

Nearly three-fourths of the apple trees in the state have now passed the early bearing period or will have completed it within a few years. Most of these trees have probably passed the period of the most rapidly increasing yields. During the next few years, a considerably smaller number of trees will be passing through this period, which will have a tendency to counteract the increase due to the larger number of young trees coming into bearing.

Varieties. Four varieties, Winesap, Delicious, Jonathan, and Rome Beauty, accounted for over three-quarters of the commercial apple trees of the state, and Yellow Newtown, Esopus Spitzenberg, Stayman, and Winter Banana represented an additional 12 per cent in 1928.¹

Recent plantings have been concentrated on even fewer varieties. The Survey of the Bureau of Agricultural Economics indicates that in 1928, 50 per cent of the trees eight years of age or younger were Delicious, 28 per cent were Winesap, and 9 per cent were Rome Beauty. Delicious and Winesap represented over 75 per cent of the trees under nine years of age, and together with Rome Beauty they accounted for nearly 85 per cent of the young trees of the state. This

¹ U. S. Dept. of Agriculture, Estimated Number of Apple Trees by Varieties and Ages in Commercial and Farm Orchards in Washington, January 1, 1928. (Mimeograph) Table 2.

indicates that most of the additional tonnage from young trees beginning to bear will be of these three varieties.

Winesap is the leading variety in Washington. In January 1928 there were approximately two million Winesap trees in the state which represented 31 per cent of the total number of trees. During the three years just prior to 1928, Winesap planting in the state averaged only about 34,000 trees annually or about 1.7 per cent of the total number of trees, which is not sufficient to maintain the number of bearing trees.

In 1928, 1.5 million or 78 per cent of the Winesap trees of the state were between 14 and 23 years of age. Nearly one-fifth or 378,000 trees were less than 14 years of age in 1928 of which about three-fourths were between 4 and 13 and about one-fourth were less than 4 years old, while less than 3 per cent were 24 years of age or older. Thus over three-fourths of the Winesap trees have been passing through the period of early bearing during recent years and are now entering the age where yields do not increase as rapidly, while only about one-fourth as many will be passing through the early bearing age during the next few years. (Fig. 23).

Winesap production in Washington may be expected to increase less rapidly during the next few years, and if planting trends do not change materially, the increase may later cease entirely.¹

There were 1.3 million **Delicious** trees in the commercial orchards of Washington in 1928 which was 20 per cent of the total number of trees. The ages of these trees are shown in Figure 23. Nearly one-half of the trees of this variety were between the ages of 14 and 23 years and a little over one-half were less than 14 years of age, indicating that about the same number of trees will continue to pass through the period of early bearing during the next few years. Delicious plantings from 1925 to 1927 averaged about 50,000 trees a year, which was essentially the same as during the 10 years preceding, but during both periods the rate of planting was considerably more than sufficient to maintain the number of bearing trees. Delicious production in Washington will continue to increase during the next few years at somewhere near the present rate.

Large increases in the **Delicious** crop of the United States are in prospect with greater increases in the **Barrel** section than in the **Box** section.¹ This will probably cause the loss of a considerable part of the favorable price differentials received for this variety in the past. Good color plays an important part in quality of **Delicious**, apples having little or no red color being inferior in flavor and quality to highly colored fruit. The color factor will undoubtedly give an ad-

¹ See also pages 33 to 35.

vantage to growers in sections of the country where high color is easily obtainable.

The heavy increases in production will have a less adverse effect on the prices of Washington Delicious, if the product proves to be of markedly superior quality. The future of Washington Delicious prices depends on quality as well as quantity of the crop that materializes from the recent heavy plantings throughout the country.¹

Estimated Numbers of Trees of Various Ages of Four Principal Varieties of Apples, Washington, January 1, 1928

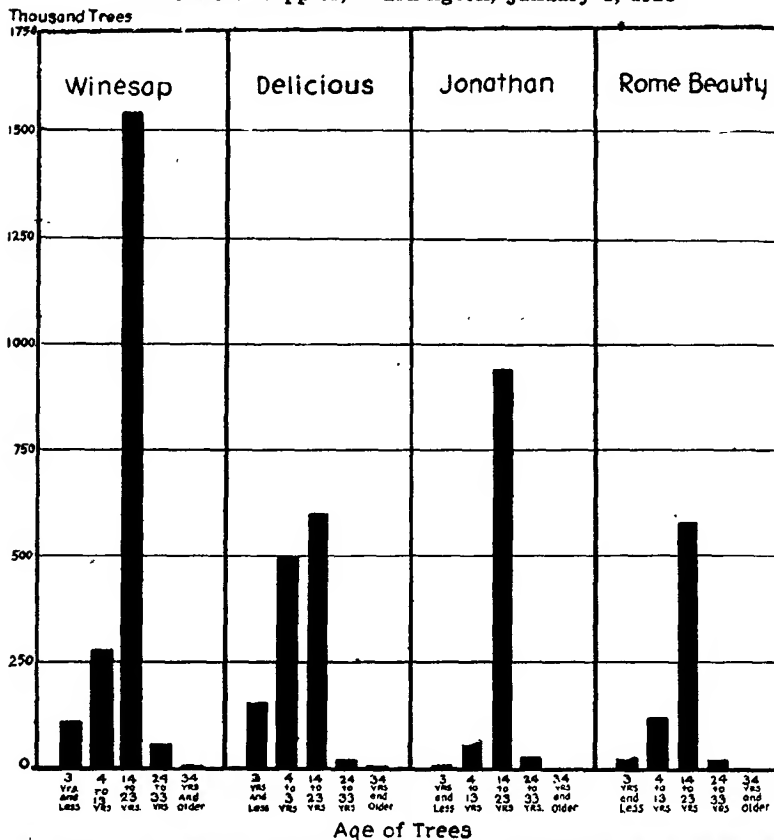


Figure 23. The largest proportion of the trees of the important varieties was between 14 and 23 years of age in 1928. More recent plantings have been mostly Delicious with a considerable number of Winesap and much less of Rome Beauty and Jonathan. (Data from U. S. Dept. of Agri., Estimated Number of Apple Trees by Varieties and Ages in Commercial and Farm Orchards in Washington, Jan. 1, 1928, Table 5, (Mimeograph).)

¹ See also pages 30 to 33.

Jonathan is the third most important variety in Washington. There were one million trees of this variety in 1928 which represented 16 per cent of the trees of the state. The number of Jonathan trees of various ages is shown in Figure 23. As only 0.5 per cent were less than four years old, the planting rate is far below that necessary to maintain the present number of bearing Jonathan trees. About 91 per cent of the Jonathan trees of the state were between 14 and 23 years of age in 1928, and these trees will soon have completed the early bearing period. The production of Jonathans has probably about reached its peak and may be expected to decline soon. In view of the expected increase in the East North Central States, Washington will probably produce a considerably smaller part of the total Jonathan crop of the United States in the near future than it has during recent years.

Rome Beauty is the fourth variety in importance in Washington. There were 735,000 trees of this variety in 1928 which was 12 per cent of the trees of the state. The number of trees in the various age groups in that year is shown in Figure 23. Plantings of this variety averaged about 9,000 trees annually from 1925 to 1927, having decreased slightly from the average of the preceding 10 years. This rate is not sufficient to maintain the number of bearing trees.

Over three-fourths of the Rome Beauty trees were between 14 and 23 years old in 1928. Since a much smaller number will be passing through the age of rapidly increasing yields during the next few years and since plantings are not sufficient to maintain the present number of bearing trees, Rome Beauty production will probably increase less rapidly during the next few years.

There were 252,000 **Yellow Newtown** trees in Washington in 1928 which was 4 per cent of all the apple trees of the state. About 93 per cent of these trees were between 14 and 23 years of age and by 1932 had about completed the early bearing period. Only about 3 per cent of these trees were less than 14 years old in 1928. The rate of planting during the three years before 1925 was not sufficient to maintain the number of bearing trees. Any significant increase in the Yellow Newtown production of the state during the next few years does not appear to be in prospect.

Other varieties are of relatively small importance, amounting to only 17 per cent of all trees.

WESTERN WASHINGTON

Most of the apples produced west of the Cascade Mountains in Washington are from farm orchards. In 1910 before the large increase in apple production of the state took place, about one-third of the

crop of Washington was produced in this section, but during the last 20 years, the proportion has steadily declined until in 1930 only about 2 per cent of the crop was grown in Western Washington. (Table 9.) Only a small part of the apple crop of this area enters commercial channels. (Table 20.) A few apples move to local markets by motor truck and by boat, but car-load shipments by rail are negligible.

The number of bearing apple trees in this section has decreased steadily during the last 20 years. In 1930 this area had only about one-half as many bearing trees as in 1910 and had only 9 per cent of the bearing apple trees of the state. The number of young trees that had not attained bearing age in 1930 was less than one-half as great as in 1920, and more trees are being eliminated than are being planted. Apple production in Western Washington may be expected to continue to decrease.

THE COMMERCIAL APPLE DISTRICTS OF WASHINGTON

Nearly all of the commercial apple crop produced in the state of Washington is grown in the irrigated valleys east of the Cascade Mountains. These producing sections are usually divided into five districts (Fig. 24) on the basis of geographic location and trade practices as follows:

1. Wenatchee-Okanogan District, composed of the counties of Chelan, Okanogan, Douglas, and Grant.
2. Yakima District, including the counties of Yakima, Benton, Kittitas, and Franklin.
3. Walla Walla District, including the counties of Walla Walla, Asotin, Columbia, and Garfield.
4. Spokane District, including the counties of Spokane, Pend Oreille, Stevens, Ferry, Lincoln, Adams, and Whitman.
5. White Salmon District, including the apple-producing areas in Klickitat and Skamania counties which are across the Columbia River from the Hood River District in Oregon.

These five districts have about 90 per cent of the apple trees of the state and produce about 98 per cent of the total crop and nearly all of the commercial crop. Production, however, is heavily concentrated in the Wenatchee-Okanogan and Yakima districts which have 86 per cent of all the apple trees and furnish over 94 per cent of the carload shipments of the state.

Spokane District. The Spokane district is the third most important commercial district in the state in apple production. During the five years from 1926 to 1930 apple shipments from this district averaged 1,039 cars annually or less than 3 per cent of the total shipments

Apple Districts and Subdistricts in Washington

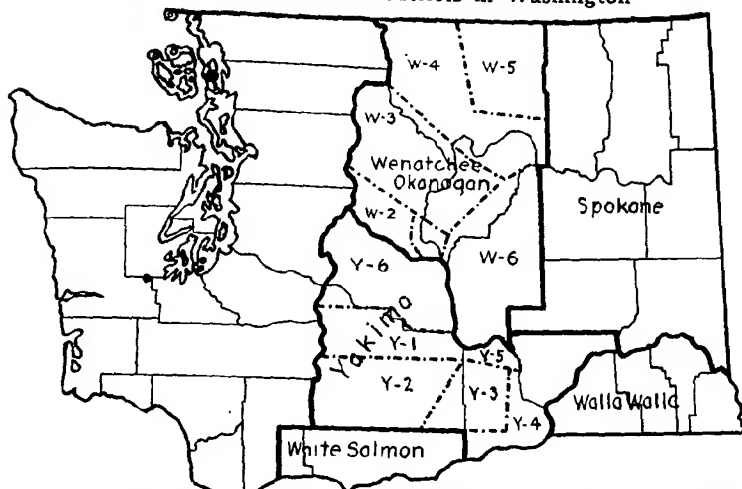


Figure 24. Practically all of the commercial apple crop of Washington is raised in the five districts east of the Cascades. The two most important districts have been subdivided into subdistricts.

of the state. Car-lot shipment data indicate a decrease of 42 per cent between 1921-25 and 1926-30. (Fig. 25). This was caused by a decrease in the number of trees. In 1910 there were less than one million trees; in 1920, 1.5 million trees and in 1925, one million. In 1930 there were only 367,000 trees or about 25 per cent of the number in 1920. If the rate of decrease of the five years ending in 1930 should be maintained, all the bearing trees will have been eliminated in three years.

Plantings averaged 15,000 trees a year in 1927 and 1928, but decreased to about 3,000 a year in 1929 and 1930. The recent rate of planting is not sufficient to maintain the number of bearing trees since eliminations have been so heavy during recent years.

Walla Walla District. The Walla Walla District shipped an average of 620 cars of apples annually during the last five years, which was less than 2 per cent of the shipments of the state. The trend of shipments has been downward since 1921. (Fig. 25). Between the first five and the last five years of the period, average shipments decreased 194 cars or 24 per cent. There were 116,000 bearing trees in the district in 1930, which was less than in 1910 and less than one-half as many as in 1920. The decrease between 1925 and 1930 was twice as rapid as during the preceding five years.

**Car-lot Shipments of Apples, Spokane, Walla Walla and White
Salmon Districts, Washington, 1921-1931**

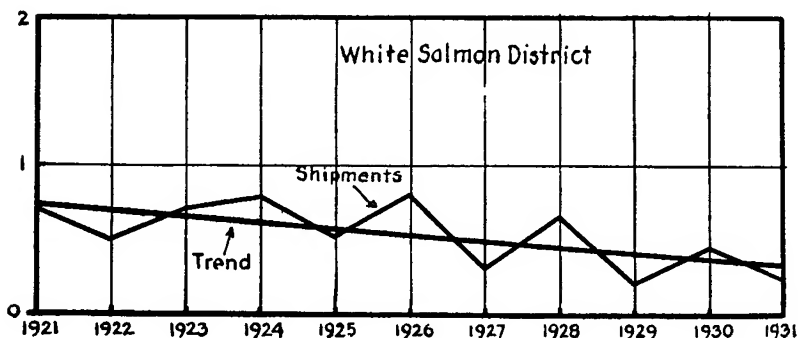
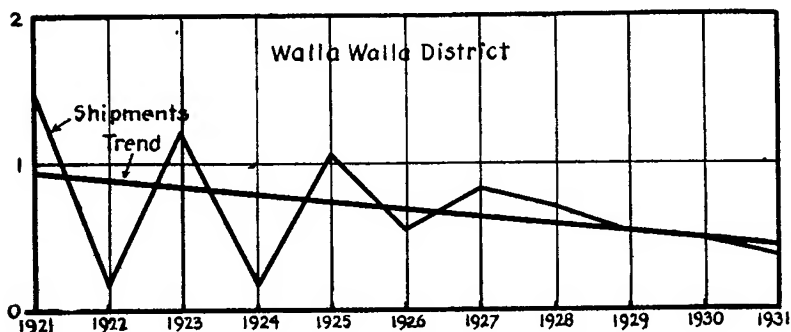
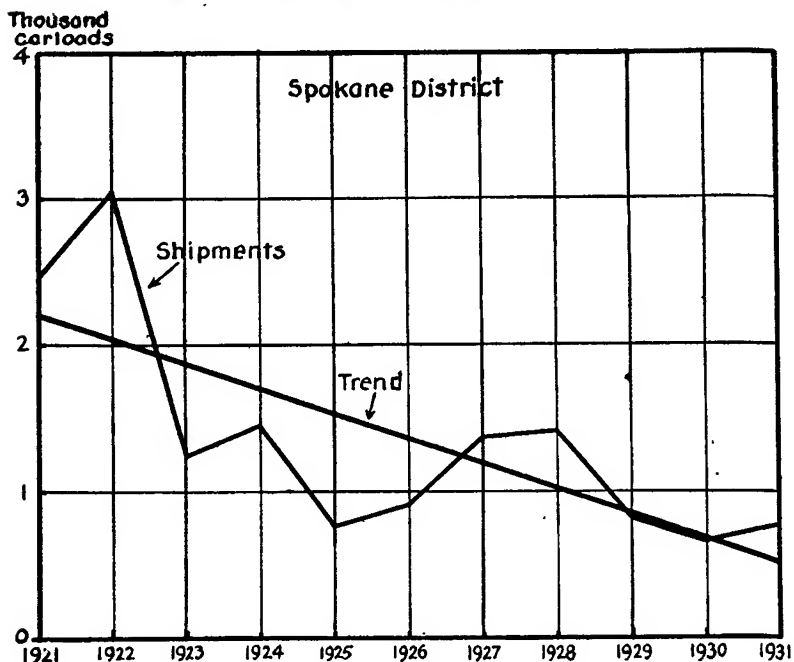


Figure 25. The trend of carload shipments of apples from the Spokane, Walla Walla, and White Salmon Districts has been decidedly downward during recent years. (Data from Table 14.)

The rate of tree planting has been about 2,000 trees a year during recent years and is not sufficient to maintain the number of trees. The decrease in tonnage may be expected to continue.

White Salmon District. Apple shipments from the White Salmon District have been decreasing during the last ten years (Fig. 25). During the five years from 1921 to 1925, the district shipped an average of 643 cars, while during the five years, 1926 to 1930, shipments averaged 486 cars, a decline of 25 per cent. The district contributed 1.3 per cent of the apple shipments of the state during the last five years.

The number of bearing trees increased until 1925 when there were 283,000 in the district. Plantings since 1925 have not been sufficient to maintain the number of bearing trees, and in 1930 only 113,000 bearing trees remained. This was a decrease of 60 per cent in five years.

WENATCHEE-OKANOGAN DISTRICT

This district has been divided into six subdistricts because of varying conditions. (Fig. 24). The subdistricts are so made that there is a minimum of interhauling by motor truck, and are as follows:

- W-1 The Vicinity of Wenatchee from Rock Island to Wagnersburg¹ and including Sunnyslope, Wenatchee Heights, East Wenatchee, Malaga, Stemilt Hill, and Clockum.
- W-2 Wenatchee River Valley from Leavenworth to, but not including, Olds.
- W-3 Entiat-Chelan, extending from Wagnersburg¹ to Wells and including Orondo, Chelan, Manson, Chelan Falls, and all fruit land adjacent to Lake Chelan.
- W-4 Lower Okanogan from Starr to Wakefield, including Monse, Bridgeport and Bridgeport Bar, Brewster, Pateros, and the Methow Valley.
- W-5 Upper Okanogan from Malott to Oroville including Okanogan, Omak, Riverside, Key Stone, Tonasket, Ellisford, and apple-producing country back from the railway.
- W-6 Grant County and the area east of Rock Island, including Moses Coulee and Crescent Bar.

Car-lot Shipments. Apple shipments from the Wenatchee-Okanogan district increased from an average of 15,707 carloads from 1921 to 1925 to an annual average of 19,764 during the five years, 1926 to

¹The number of trees around Wagnersburg was included with the Entiat enumeration by the Department of Horticulture, while the carlot shipments include them in the Wenatchee sub-districts. Data are not available to allow correction for this slight error.

Car-load Shipments of Apples, Wenatchee-Okanogan, Yakima and Other Districts, Washington, 1921-1931

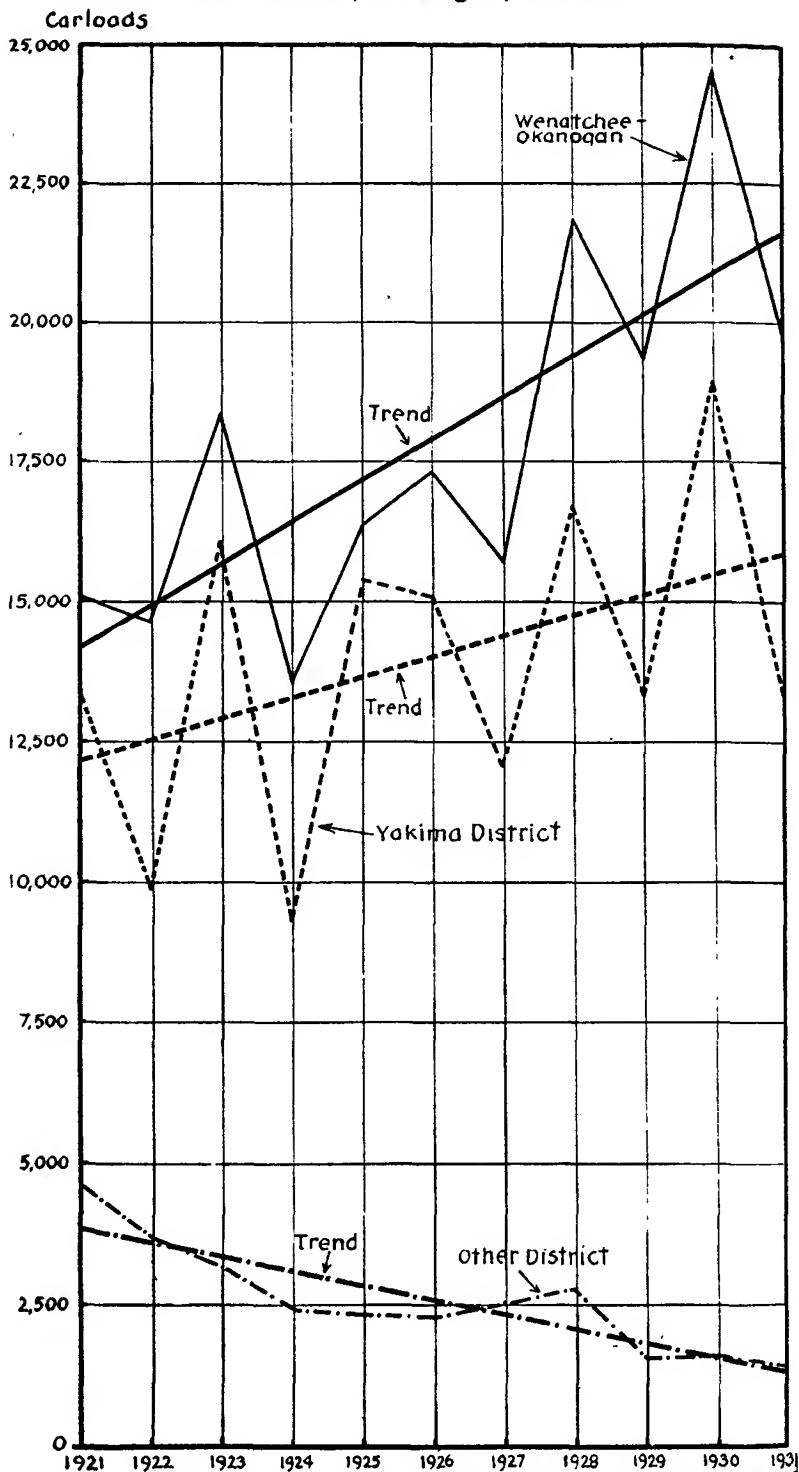


Figure 26. The trend of apple shipments from the Wenatchee-Okanogan and Yakima Districts has been upward during the last ten years, while shipments from the other districts have declined. (Data from Table 14.)

1930 or 26 per cent. (Fig. 26). During the last five years, the district has supplied 53 per cent of the apple shipments of the state.

Production has increased in all the subdistricts during recent years. Average annual shipments and the percentage of the Wenatchee-Okanogan crop shipped from each subdistrict between 1926 and 1930, together with the percentage of increase between the two five-year periods, 1921-1925 and 1926-1930, were as follows:

	Average annual carloads shipped 1926-1930	Percentage of shipments 1926-1930	Percentage increase between 1921-25 and 1926-30
W-1, Vicinity of Wenatchee	7,182	36.3	23.5
W-2, Wenatchee River Valley	4,575	23.1	13.5
W-3, Entiat-Chelan	3,276	16.6	51.5
W-4, Lower Okanogan	1,388	7.0	48.1
W-5, Upper Okanogan	2,260	11.5	18.2
W-4 & W-5, Okanogan	3,648	18.5	28.2
W-6, Grant County and Moses Coulee	1,083	5.5	28.1
Total Wenatchee-Okanogan district ¹	19,764	100.0	25.8

¹ See note, Table 18, page 93.

The trend of carlot shipments from these various subdistricts is indicated in Figures 27 and 28.

Apple Trees. There were 2 million bearing apple trees in the Wenatchee-Okanogan district in 1930 which was 38 per cent of the bearing trees of the state. This was three times the number in 1910 but 26 per cent less than 1920. The decrease during recent years is greater than between 1920 and 1925. The 483,000 trees that had not attained bearing age in 1930 were 51 per cent of the non-bearing trees of the state. This indicates that slightly more young apple trees have been planted in the Wenatchee-Okanogan district during recent years than in all the rest of the state, and that more trees will begin bearing in this district within a few years than in the remainder of the state.

Although apple trees were eliminated at an average rate of at least 100,000 trees annually between 1920 and 1930, the net decrease in bearing trees averaged only 70,000 a year, because of the young trees reaching bearing age. Eliminations were greater in this district than in any other except Spokane.

Car-lot Shipments of Apples, Wenatchee-Okanogan Subdistricts,¹ 1921-1931

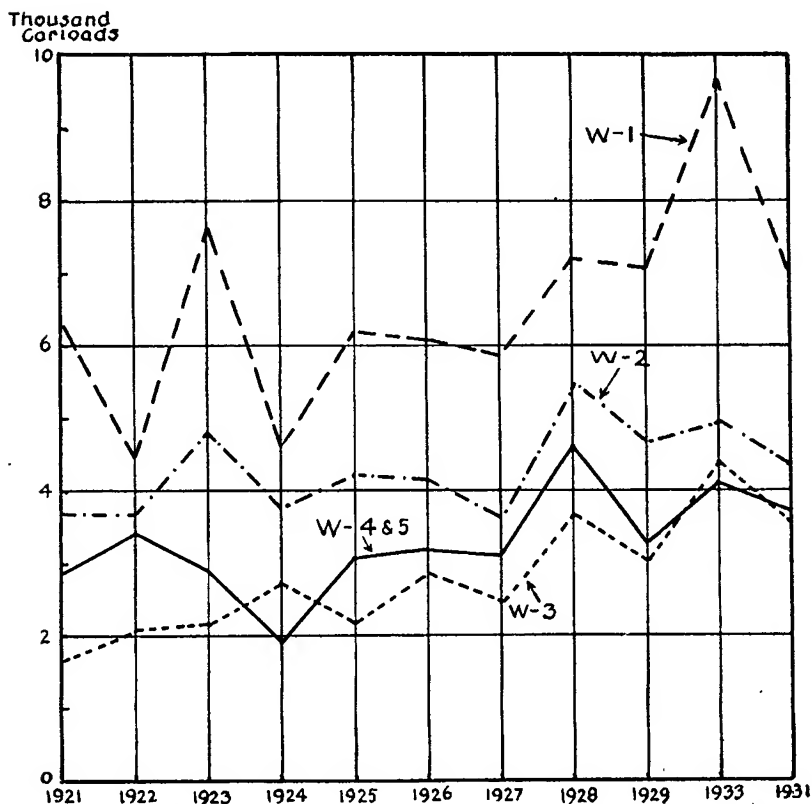


Figure 27. Apple shipments have been increasing in the different subdistricts of the Wenatchee-Okanogan District during recent years. (Data from Table 15.)

¹ See Figure 24 and page 57 for location of subdistricts.

The apple tree survey of the Bureau of Agricultural Economics indicates that there were nearly 2.5 million apple trees in the Wenatchee-Okanogan district on January 1, 1928, the ages of which were as follows:

Ages	Years planted	Number of trees	Per cent
3 years and younger	1925-1927	90,761	3.7
4 to 13 years	1915-1924	458,667	18.5
14 to 23 years	1905-1914	1,830,968	73.8
24 to 33 years	1895-1904	97,898	4.0
34 to 43 years	1885-1894	1,092	—
Total of all ages		2,479,386	100.0

Car-lot Shipments of Apples, Wenatchee-Okanogan Subdistricts,¹
1921-1931

Thousand
carloads

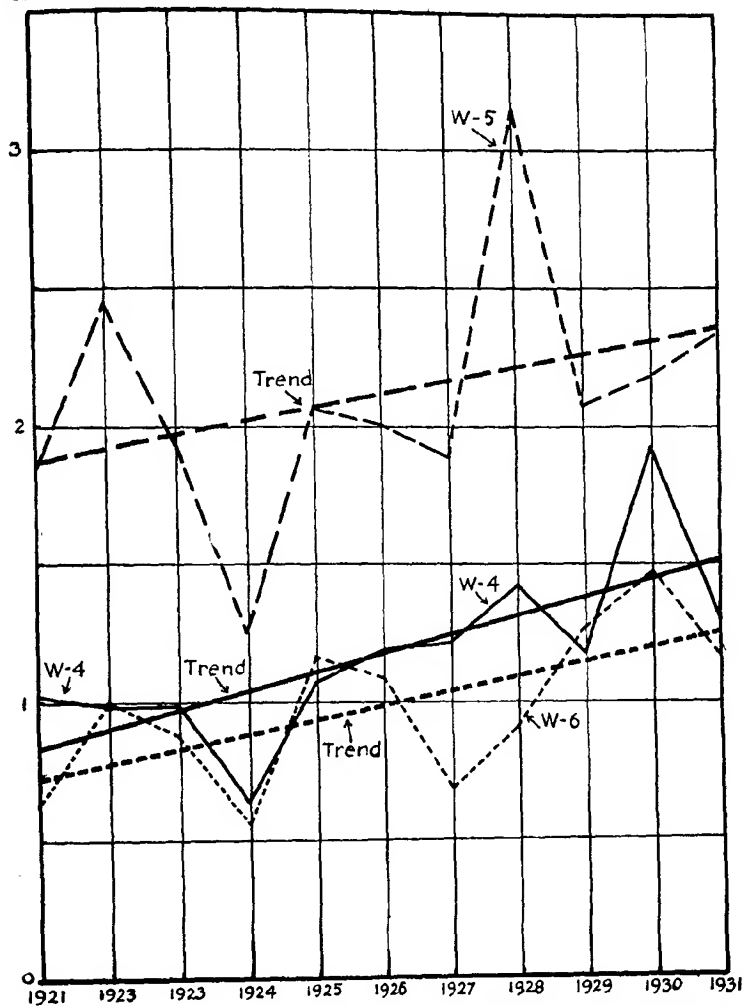


Figure 28. Apple shipments from the subdistricts in Okanogan, Douglas, and Grant counties, have increased during recent years. (Data from Table 15.)

¹ See Figure 24 and page 57 for location of subdistricts.

Since nearly three-fourths of the trees were between 14 and 23 years of age in 1928 and about 22 per cent were less than 14 years of age, only about one-fourth as many trees will be passing through the early bearing age during the next few years as during recent years.

Although many orchards have already been thinned by tree-removal there was an average of 66.1 apple trees per acre in the district in 1928. This indicates that the average distance between trees was about 25 to 26 feet. At this distance many trees will begin to crowd one another before full bearing would otherwise have been reached. The influence of age of trees and orchard crowding on yields may be expected to become even more important during the next few years.

The rate of planting apple trees in the district has been steadily increasing since the low point between 1915 and 1920 and reached about 120,000 a year in 1929 and 1930 which was eight times the rate of 10 or 12 years earlier according to the State Fruit Tree census. Recent plantings have been more than enough to maintain the number of bearing trees. Since about 100,000 trees were eliminated annually from the orchards of the district between 1920 and 1930, average plantings did not exceed average eliminations until 1929 and 1930. If these trends do not change materially during the next few years, there will be an increase in the number of apple trees in the district.

Varieties. During the five years from 1926 to 1930, 37 per cent of the car-lot apple shipments were Winesap, 22 per cent were Delicious, 14 per cent were Jonathan, and 8 per cent were Rome Beauty, the four varieties accounting for 81 per cent of the shipments of the district.

Average car-lot shipments of these varieties from the Wenatchee-Okanogan district during the five-year periods 1921-25 and 1926-30 together with the rate of increase between the two periods were as follows:¹

Variety	1921-1925	1926-1930	Percentage	
			Increase	Decrease
Winesap	5,112	6,964	36.2	—
Delicious	2,325	4,126	77.5	—
Jonathan	2,411	2,626	8.9	—
Rome Beauty	1,269	1,554	22.3	—
Other Varieties	3,778	3,497	—	7.4
All varieties	14,895	18,767	26.0	—

The trend of shipments of these varieties is indicated in Figure 29.

¹ See footnote, Table 18, page 93.

Car-lot Shipments of Four Leading Varieties of Apples, Wenatchee-Okanogan District, 1921-1931

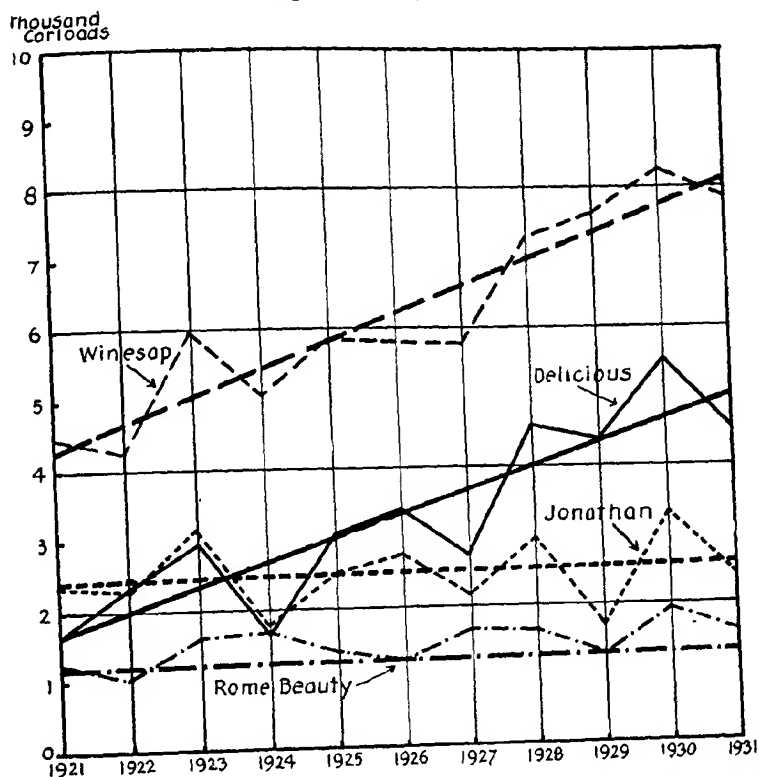


Figure 29. Shipments of Winesap and Delicious from the Wenatchee-Okanogan District have increased very rapidly during recent years, while shipments of Rome Beauty and Jonathan have increased only slightly. (Data from Table 17.)

The number of trees of the seven more important varieties and those under five years of age in the Wenatchee-Okanogan district in 1931, as shown by the state of fruit tree census, were as follows:

Variety	Trees all ages		Trees under five years	
	Number	Per cent	Number	Per cent
Delicious	918,000	38.6	317,000	78.4
Winesap	757,000	31.9	45,000	11.1
Jonathan	213,000	9.0	4,000	1.0
Rome Beauty	134,000	5.6	14,000	3.5
Stayman	117,000	4.9	—	—
Esopus Spitzenberg	77,000	3.2	—	—
Winter Banana	65,000	2.7	4,000	1.0
Other Varieties	95,000	4.1	20,000	5.0
All Varieties	2,376,000	100.0	404,000	100.0

Approximately 71 per cent of all the apple trees in the district were Delicious and Winesap in 1931, 39 per cent being Delicious and 32 per cent Winesap. These two varieties together with Jonathan and Rome Beauty constituted 85 per cent of the trees of the district, while the seven varieties account for 96 per cent of the total.

Shipments of Delicious averaged 4,126 cars annually between 1926 and 1930 or 37 per cent of total shipments. This was more than any variety except Winesap. Between 1921-25 and 1926-30 Delicious shipments from the district increased 78 per cent which was the largest rate of increase shown by any variety.

The state fruit tree census indicates that there were 918,000 Delicious trees in the district in 1931, which was more than any other variety and amounted to 39 per cent of all the trees in the district. Recent plantings of Delicious have been more than three times those of all other varieties combined, since 78 per cent of the trees under five years old were Delicious.

The number and percentage of Delicious trees of various ages in the Wenatchee-Okanogan district in 1931, together with the approximate annual planting rates were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting:
1 and 2 years	1929-1930	193,000	21.0	96,500
3 and 4 years	1927-1928	124,000	13.5	62,000
5 to 10 years	1921-1926	210,000	22.9	35,000
11 to 15 years	1916-1920	32,000	3.5	6,400
16 years and older	1915 and before	359,000	39.1	—
All ages		918,000	100.0	—

Since about 39 per cent of the trees had either completed or were in the latter part of the early bearing period in 1931 and 25 per cent were 5 to 15 years old and were either beginning or were in the early

part of the period, the number of Delicious trees that will pass through the early bearing period during the next few years will be nearly the same as during recent years. After a few years, however, the number will increase since one-third of the trees are under five years of age.

The approximate rate of Delicious planting has been increasing during the last 10 or 12 years; in 1929 and 1930, it averaged 96,000 trees annually or over 10 per cent of the total number of trees. The average number of Delicious trees coming into commercial bearing will probably continue to increase during the next few years, and assuming that an apple tree in this district begins commercial bearing at about seven years of age, by 1936 or 1937 the number of trees beginning to bear in commercial quantities will be from two to two and one-half times greater than it has been during recent years.

If present trends continue, Delicious production in the Wenatchee-Okanogan district will continue to increase rapidly. The Delicious crop of this district may be expected to exceed that of Winesap before many years.

There are more Winesap apples shipped from the Wenatchee-Okanogan district than any other variety. During the five years from 1926 to 1930, shipments averaged 6,964 cars or 37 per cent of total shipments. This was an increase of 36 per cent over the average shipments between 1921 and 1925. The state fruit tree census indicates that until the last two or three years, there have been more Winesap trees in this district than of any other variety. In 1931 there were 757,000 Winesap trees in the district as compared to 918,000 Delicious trees, Winesap having dropped to second place.

The number and percentage of Winesap trees in the district in 1931, together with the approximate annual planting rates were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	23,000	3.0	11,500
3 and 4 years	1927-1928	22,000	2.9	11,000
5 to 10 years	1921-1926	69,000	9.1	11,500
11 to 15 years	1916-1920	25,000	3.3	5,000
16 years and older	1915 and before	618,000	81.7	—
All ages		757,000	100.0	—

Since only 3 per cent of the Winesap trees were one or two years old and 2.9 per cent were three or four years of age in 1931, recent rates of planting Winesaps have hardly been enough to maintain the number of bearing trees.

About 82 per cent of the Winesap trees of the district were 16 years of age or older in 1931, while only 12 per cent were between 5

and 15 years of age. The much larger proportion of the trees passing through the early bearing period during recent years has had a tendency toward increasing Winesap yields.

Since recent plantings are meager and the proportion of the trees passing through the period of rapidly increasing yields is becoming much smaller, it appears that Winesap shipments from the Wenatchee-Okanogan district will increase less rapidly during the next few years and may fail to increase after a few years.

Jonathan shipments from the district between 1926 and 1930 averaged 2,626 carloads annually. Although shipments of this variety have averaged 14 per cent of the total apple shipments of the district during recent years, they have increased only 9 per cent during the last 10 years.

There were 213,000 Jonathan trees in the district in 1931 which amounted to 9 per cent of the total number of trees. The number and percentage of Jonathan trees of different ages in the district in that year, together with approximate annual planting rates in the district were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	1,900	0.9	950
3 and 4 years	1927-1928	1,900	0.9	950
5 to 10 years	1921-1926	6,000	2.8	1,000
11 to 15 years	1916-1920	5,400	2.5	1,100
16 years and older	1915 and before	197,600	92.9	—
All ages		212,800	100.0	—

The rate of planting is far below an amount sufficient to maintain the number of bearing Jonathan trees. Approximately 93 per cent of the Jonathan trees of the district were 16 years or older in 1931 and have either completed or soon will have finished the early bearing period, while only 5 per cent were between 5 and 15 years of age. When fillers are removed from orchards growers often pull Jonathan trees because price returns for this variety have been lower than those of some of the more popular varieties. Jonathan production in the Wenatchee-Okanogan district will probably soon cease to increase.

Rome Beauty is the fourth variety in importance in the Wenatchee-Okanogan district from the standpoints of both shipments and the number of trees. Between 1926 and 1930 car-load shipments averaged 1,554 which was 8 per cent of total shipments, while during the last 10 years, they have increased about 22 per cent.

The state fruit tree census indicates that there were 134,000 Rome Beauty trees in the district in 1931 which was 6 per cent of the total number of trees. The number and percentage of Rome Beauty trees in

1931 (including Red Rome Beauty) together with approximate annual planting rates were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	8,500	6.3	4,200
3 and 4 years	1927-1928	6,000	4.5	3,000
5 to 10 years	1921-1926	8,400	6.3	1,400
11 to 15 years	1916-1920	3,600	2.7	700
16 years and older	1915 and before	107,200	80.2	—
All ages		133,700	100.0	—

As approximately 80 per cent of the Rome Beauty trees were 16 years old or older while only 9 per cent were between 5 and 15 years of age the number of trees passing through the early bearing period will decrease materially during the next few years.

The rate of planting 10 or 12 years ago was far less than enough to maintain the number of trees, but since then it has been steadily increasing and in 1929 and 1930, it averaged about 4,200 trees annually or a little more than 3 per cent of the total number of trees. This rate appears to be about sufficient to maintain the number of trees. The popularity of Rome Beauty, and especially Red Rome Beauty to some extent results from its ability to pollinate Delicious blossoms. The Red Rome Beauty is a more highly colored apple than the regular Rome Beauty and grades higher. Several other varieties, however, satisfactorily pollinate Delicious blossoms.

Rome Beauty tonnage will probably continue to increase moderately during the next few years, but while present ideas among growers continue, it will not increase to a point where it rivals the tonnage of either Winesap or Delicious. It may, however, increase until it is larger than the Jonathan crop.

Subdistricts. The vicinity of Wenatchee (Subdistrict W-1) had 22.8 per cent of the trees of the Wenatchee-Okanogan district in 1931 but had only 13.5 per cent of those under five years of age. The average annual rate of planting in the area has been increasing during the last 10 or 15 years and in 1929 and 1930 was more than three times as great as during the five years from 1916 to 1920. If all the young trees that were in the ground in 1930 remain, about 12,000 new trees will come into bearing each year in 1934 and 1935 and about 15,000 annually in 1936 and 1937. This compares with the annual rate of about 7,000 during recent years. It is probable that this increase will be partly offset by the elimination of trees as orchard thinning progresses.

Over three-fourths of the trees in this area were 16 years of age or older in 1931, while only 12 per cent were between the ages of 5 and 15 years. The much smaller portion of the trees, which will be passing through the early bearing period, will have a tendency to re-

tard the increase in average yields during the next few years, which will somewhat offset the increased production of the larger number of young trees coming into bearing.

About 21 per cent of the apple trees of the Wenatchee-Okanogan District in 1931 were in the Wenatchee River Valley (Subdistrict W-2), while about 17 per cent of those under five years of age were in this area. Planting of young trees in this area has been increasing during recent years. During 1929 and 1930, plantings averaged about 20,000 trees a year or about 4 per cent of the total number of trees. Whereas, during recent years about 9,000 trees have been annually reaching commercial bearing age of seven years, by 1934 and 1935 about 14,000 will come into bearing, and in 1936 and 1937 about 20,000 a year. The total number of trees will probably not increase as rapidly as this, however, because of eliminations.

About 72 per cent of the trees in this area were 16 years of age or older in 1931 and only 14 per cent were between 5 and 15 years of age. A much smaller number of trees, therefore, will be passing through the early bearing period within a few years. This will have a retarding effect on the increase in average yields per tree and will tend to offset some of the increased production resulting from the larger number of trees coming into bearing.

About 20 per cent of the apple trees of the Wenatchee-Okanogan District in 1931 were in the Entiat-Chelan area (Subdistrict W-3), but it had 26.5 per cent of the trees under five years of age. Plantings in this area have been increasing during recent years and in 1929 and 1930 averaged over 28,000 annually or about 6 per cent of the total number of trees. About 15,000 trees a year have been reaching the commercial bearing age during recent years. In 1934 and 1935 this will increase to about 25,000 annually, while in 1936 and 1937 over 28,000 will begin bearing in commercial quantities annually. The increased tonnage that will be produced by these young trees will be somewhat offset by decreases by tree removals in orchard thinning.

Only a little over one-half of the trees in this area were 16 years of age or older in 1931, while 28 per cent were between the ages of 5 and 15 years. The number of trees passing through the early bearing period, therefore, will probably be about the same during the next few years as it has been during recent years. Production in the Entiat-Chelan area may be expected to continue to increase rapidly during the next few years.

The Lower Okanogan (Subdistrict W-4) had 9 per cent of the apple trees of the district in 1931 and 13.5 per cent of the trees under five years of age. Recent planting rates in this area have been more than sufficient to maintain the number of bearing trees. In 1929 and 1930, apple tree plantings averaged 8,000 a year in this area which was

about 8 per cent of the total number of trees. If plantings should continue at the rate of the last few years, the number of apple trees will increase considerably.

About 64 per cent of the trees of the area were 16 years of age or older in 1931, while only 11 per cent were between the ages of 5 and 15 years. This indicates that there will be a decrease in the number of trees passing through the early bearing period during the next few years. As over one-third of the trees of the area are less than five years of age, the number passing through this period will increase again after a few years.

About 18 per cent of the apple trees of the Wenatchee-Okanogan District in 1931 were in the Upper Okanogan (Subdistrict W-5) but it had about 25 per cent of the trees under five years of age. New plantings in this area during recent years are markedly greater than those of 10 or 12 years ago. In 1929 and 1930, plantings averaged over 31,000 annually or about 7 per cent of the total number of trees.

About half of the trees were 16 years of age or older, while about one-fourth were between the ages of 5 and 15 years. The number of trees passing through the early bearing period, therefore, will probably decrease only slightly during the next few years, but due to recent heavier plantings, it should later increase. If many of these orchards are abandoned, however, there may be some decrease in tonnage, which will probably later be taken up by young trees coming into bearing.

The area in Grant and Douglas counties east of the vicinity of Wenatchee (Subdistrict W-6) had about 9 per cent of the trees of the Wenatchee-Okanogan District, but only 5 per cent of those under five years of age in 1931. The planting rate in this area did not increase above the low average of 10 or 15 years ago until in 1929 and 1930 when about 8,000 trees were planted annually. If the planting rate in these years indicates the beginning of an era of heavy planting, and eliminations are not great, the production of this area may increase somewhat after a few years.

About 82 per cent of the trees in this area in 1931 were 16 years of age or older, while only 9 per cent were between the ages of 5 and 15 years. Thus the number of trees passing through the early bearing period will decrease decidedly during the next few years and production will probably not increase very rapidly.

Because of recent heavy plantings, Delicious trees predominate in the Wenatchee Valley, Entiat-Chelan, and the Okanogan country. Delicious has also been heavily planted during recent years in the vicinity of Wenatchee and east in Grant and Douglas counties, but in these areas Winesap still predominates. As these two varieties account for between 85 and 95 per cent of the trees under five years of age in the different subdistricts, recent plantings of other varieties

in these areas have been made mostly for pollinizers. Other varieties of less importance are Jonathan, Rome Beauty, Stayman, Spitzenberg, and Winter Banana.

YAKIMA DISTRICT

The Yakima district includes areas with wide differences in growing conditions. It has been subdivided into smaller areas or subdistricts which are shown in Figure 24, and are as follows:

- Y-1 The vicinity of Yakima consists of the apple producing areas in Yakima County north of Union Gap.
- Y-2 The northern portion of the Lower Yakima Valley from the Gap south to Granger.
- Y-3 The central part of the Lower Yakima Valley from Sunny-side to Prosser.
- Y-4 The lower portion of the Yakima Valley along the Yakima River east of Prosser in Benton County, south and west along the Columbia River and the apple producing areas in Franklin County.
- Y-5 The vicinity of White Bluffs and Hanford includes the north-eastern part of Benton County.
- Y-6 Kittitas County.

Car-lot Shipments. Car-lot shipments of apples from the Yakima District averaged 12,789 carloads annually between 1921 and 1925 and 15,234 between 1926 and 1930, which was an increase of 19 per cent. During the five years between 1926 and 1930, the Yakima District furnished 42 per cent of total apple shipments.

Average annual shipments (Figs. 30 and 31) and the percentage of the Yakima crop shipped from each subdistrict during the five years between 1926 and 1930, together with the percentage of increase between the two five-year periods, 1921-25 and 1926-30, were as follows:

Subdistrict ¹	Average annual number of carloads shipped 1926-1930	Percentage of total shipments 1926-1930	Percentage increase or decrease ² between 1921-25 and 1926-30
Y-1	10,479	68.8	31.6
Y-2	2,208	14.5	—8.7
Y-3	1,183	7.8	—9.7
Y-4	824	5.4	23.2
Y-5	400	2.6	29.8
Y-6	141	0.9	16.8
Total Yakima District	15,235 ³	100.0	19.1

¹ See Figure 24, page 55.

² Minus sign denotes a decrease

³ See note with Table 18, page 93.

Car-lot Shipments of Apples, Yakima Subdistricts, 1921-1931¹
 Thousand Carloads

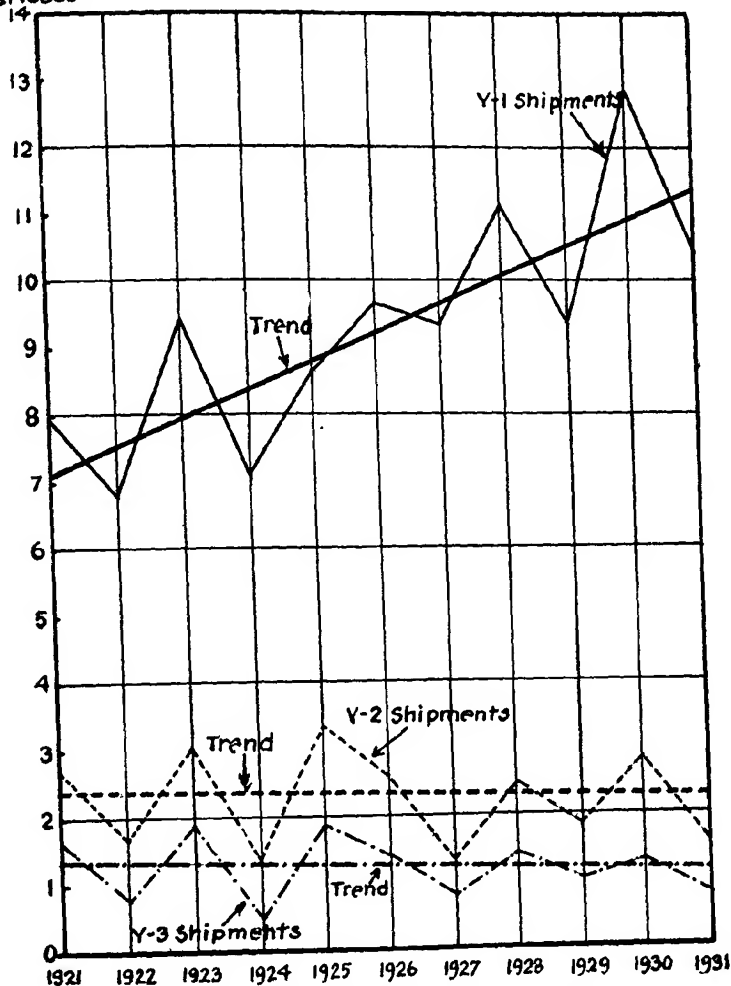


Figure 30. Apple shipments have increased rapidly in the Vicinity of Yakima during recent years, while in the upper and central part of the lower valley, they have decreased. In the remainder of the district they have increased only slightly. (Data from Table 16.)

¹See Figure 24 and page 70 for location of subdistricts.

Car-lot Shipments of Apples, Yakima Subdistricts, 1921-1931¹

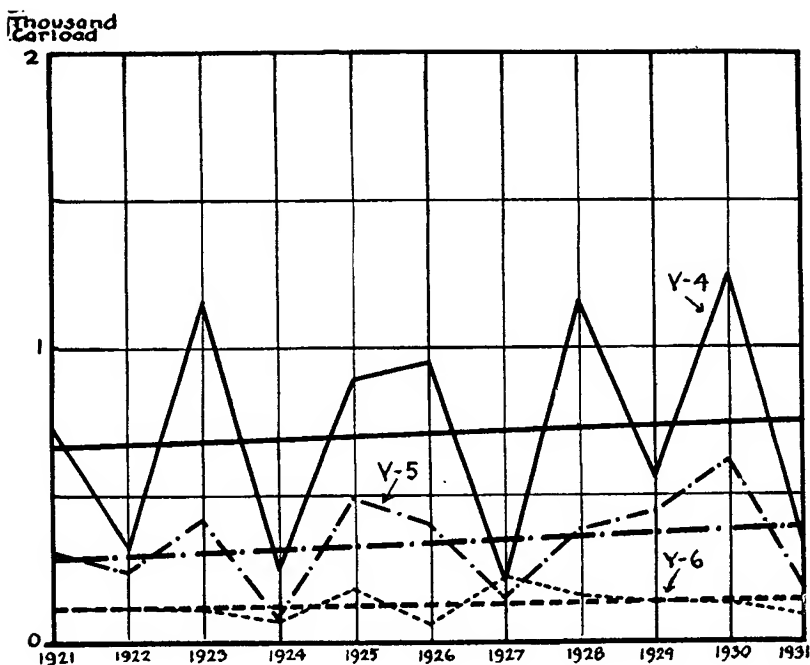


Figure 31. Apple shipments have increased slightly in the lower part of the Yakima Valley, Hanford-White Bluffs area, and Kittitas County during recent years. (Data from Table 16.)

¹ See Figure 24 and page 70 for location of subdistricts.

During the five years from 1926 to 1930, the vicinity of Yakima (Y-1) furnished over two-thirds of the apple shipments of the entire district. The vicinity of Yakima is not only the most important apple producing area in the district, but its production has been increasing rapidly (Fig. 30). Apple production is decreasing in the upper and central part of the Lower Yakima Valley (Y-2 and Y-3). In the remaining subdistricts, production is increasing, but these areas combined produce less than 10 per cent of the crop of the district.

Shipments from the Lower Yakima Valley (Subdistrict Y-4) averaged 689 cars annually between 1921 and 1925 and 824 cars a year between 1926 and 1930. The area has furnished 5 per cent of the shipments of the district between 1926 and 1930.

Apple shipments from the White Bluffs-Hanford area (Subdistrict Y-5) averaged 308 cars annually between 1921 and 1925, and increased

to 400 carloads a year between 1926 and 1930 (Figure 31). The area has shipped less than 3 per cent of the apples of the district during recent years but is increasing slightly in importance.

The apple shipments of Kittitas County (Subdistrict Y-6) averaged 121 cars annually between 1921 and 1925 and increased 20 cars or 17 per cent to 141 cars between 1926 and 1930. (Figure 31). As the area

Car-lot Shipments of Four Leading Varieties of Apples, Yakima District, 1921-1931

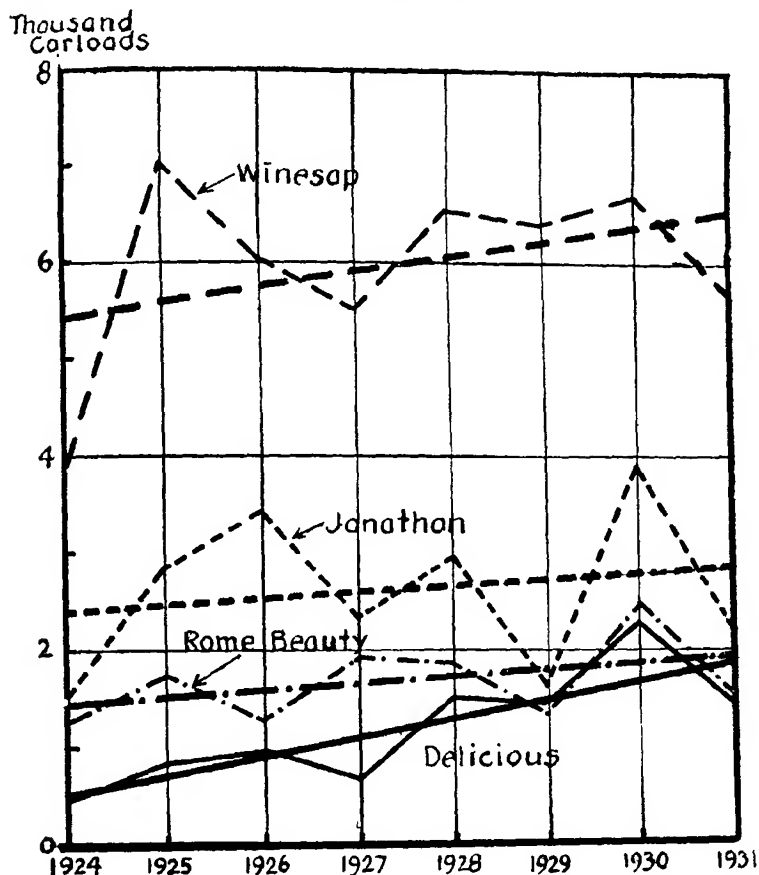


Figure 32. Shipments of Winesaps and Delicious have increased considerably from the Yakima District during recent years, but the trend of Jonathan and Rome Beauty shipments has increased only slightly. (Data from Table 18.)

produces less than one per cent of the total apple shipments of the Yakima district, its importance is slight.

Apple Trees. There were 2.1 million bearing apple trees in the Yakima district in 1930, which was 41 per cent of the bearing trees of the state according to the United States Census. This was between two and three times as many bearing trees as there were in 1910 but a decrease of 11 per cent from the number in 1920. About three-fourths of this decrease since 1920, took place in the latter half of the period.

Since the number of bearing trees increased 1.9 million between 1910 and 1920, plantings must have been heavy just prior to 1910. During the years just before 1920, plantings decreased, for only 7 per cent of the trees in that year had not attained bearing age. Between 1920 and 1930 the rate of planting increased, for 14 per cent of the trees in 1930 had not reached bearing age.

There was a net decrease of 27,000 trees a year from 1920 to 1930. This was the result of the number of young trees reaching bearing age and an average annual elimination of at least 45,000 trees a year. Eliminations in the Yakima district were about two-thirds as great as in the Wenatchee-Okanogan district during the 10 years.

There were 2.5 million apple trees in the Yakima district in 1928, about 72 per cent of which were between 14 and 23 years of age, while 20 per cent were between 4 and 13 years old. Nearly three-fourths of the trees have either completed or soon will have completed the period of early bearing and only one-fifth will be passing through this period during the next few years. This will tend to cause yields to increase less rapidly.

The average number of apple trees per acre in the Yakima district in 1928 was 62.4 which would indicate an average planting distance of between 26 and 27 feet. At this distance many trees may be expected to crowd before they reach full bearing. This will have a tendency to retard the increase in production unless trees are removed.

The number of trees of various ages in the Yakima district in 1931 as indicated by the fruit tree census of the State Department of Agriculture was as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	128,268	5.9	64,000
3 and 4 years	1927-1928	90,232	4.1	45,000
5 to 10 years	1921-1926	331,514	15.2	55,000
11 to 15 years	1916-1920	84,415	3.9	17,000
16 years and older	1915 and before	1,544,664	70.9	—
All ages		2,179,093	100.0	—

The planting rate during 1929 and 1930 averaged about 64,000 trees a year which was about 3 per cent of the total number of trees. During the last 10 or 12 years, the planting rate averaged about 55,000 trees a year. The elimination of apple trees during the last decade averaged somewhat over 45,000 a year, indicating that the number of trees being planted in the district probably slightly exceeds eliminations.

The increase in production due to the increase in new plantings will be at least partly offset by tree eliminations and a large decrease in the number of trees passing through the period during the next few years.

Varieties. The four principal varieties in the order of their importance are Winesap, Jonathan, Rome Beauty, and Delicious. These accounted for 89 per cent of the shipments of the district between 1926 and 1930. Shipments of each of these varieties have increased decidedly since 1924 (Fig. 32).

The total number of trees of these four main varieties and those under five years of age in 1931 in the Yakima district were as follows:

Variety	Trees all ages		Trees under five years	
	Number	Per cent	Number	Per cent
Winesap	923,368	42.4	56,655	25.9
Delicious	463,607	21.3	145,484	66.6
Jonathan	365,570	16.8	2,457	1.1
Rome Beauty	236,046	10.8	7,773	3.6
Other Varieties	190,502	8.7	6,131	2.8
All Varieties	2,179,093	100.0	218,500	100.0

While there were more Winesap trees than of any other variety, twice as many young Delicious trees were set out in the district between 1927 and 1930 as of all other varieties combined. Winesap plantings were second in importance.

Shipments of **Winesaps** averaged 6,241 cars between 1926 and 1930, which was 45 per cent of the apple shipments of the district. Shipments of this variety increased 16 per cent between the two three-year periods, 1924-26 and 1928-30 (Fig. 32).

About 42 per cent of the apple trees in the Yakima district were Winesap in 1931, but the proportion of Winesap trees is declining. The number and percentage of Winesap trees in the district in 1931, together with approximate annual planting rates were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	25,999	2.8	13,000
3 and 4 years	1927-1928	30,656	3.3	15,000
5 to 10 years	1921-1926	102,110	11.1	17,000
11 to 15 years	1916-1920	26,545	2.9	5,000
16 years and older	1915 and before	733,058	79.9	—
All ages		923,368	100.0	—

The rate of planting Winesaps has been decreasing during the last 10 years, and in 1929 and 1930 averaged about 13,000 annually or about 1.4 per cent of the total number of Winesap trees, which is not sufficient to maintain the present number of bearing trees.

About 80 per cent of the Winesap trees in the district were 16 years of age or older in 1931 and have completed, or soon will have completed, the early bearing period, while only 14 per cent were between the ages of 5 and 15 years. The proportion of Winesap trees passing through the period of rapidly increasing yields will decline decidedly within a few years. Shipments of this variety will probably increase less rapidly in the near future.

Shipments of **Delicious** from the Yakima district between 1926 and 1930 averaged 1,366 cars annually or 10 per cent of the total. Shipments of this variety increased 1,000 cars or 136 per cent between the two three-year periods, 1924-26 and 1928-30 (Fig. 32).

There were 464,000 Delicious trees in the district in 1931 which was 21 per cent of all apple trees, while that variety accounted for 67 per cent of the trees under five years of age. The number and percentage of Delicious trees of different ages in the district in 1931, together with approximate annual planting rates, were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	92,796	20.0	46,000
3 and 4 years	1927-1928	52,688	11.4	26,000
5 to 10 years	1921-1926	163,322	35.2	27,000
11 to 15 years	1916-1920	28,821	6.2	5,700
16 years and older	1915 and before	125,980	27.2	—
All ages		463,607	100.0	—

The rate of Delicious planting in the Yakima district has been more than sufficient to maintain the number of bearing trees of that variety since about 1921. During 1929 and 1930, however, about 70 per cent more Delicious trees were planted each year than the annual rate during the six or seven years immediately preceding. Delicious trees, therefore, will continue to come into bearing at a rapid rate.

Since only 27 per cent of the trees were 16 years of age or older in 1931 and 41 per cent were between the ages of 5 and 15 years, a much larger proportion of the trees will be passing through the period of rapidly increasing yields during the next few years than during recent years. Since new plantings and the proportion of trees passing through the period of rapidly increasing yields are both increasing, Delicious tonnage in the Yakima district may be expected to continue to increase rapidly during the next few years.

Car-lot shipments of **Jonathan** between 1926 and 1930 averaged 2,849 which was 21 per cent of the total shipments of the district.

Shipments of this variety increased only 9 per cent between 1924-1926 and 1928-1930 (Fig. 32). There were 366,000 Jonathan trees in the district in 1931 which represented 17 per cent of the total number of trees. Only one per cent of the trees under five years of age were Jonathan.

The number and percentage of Jonathan trees in the Yakima district in 1931 and the approximate planting rates were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	1,814	0.5	900
3 and 4 years	1927-1928	643	0.2	300
5 to 10 years	1921-1926	14,821	4.1	2,700
11 to 15 years	1916-1920	7,473	2.0	1,500
16 years and older	1915 and before	340,819	93.2	—
All ages		365,570	100.0	—

About 93 per cent of the Jonathan trees were 16 years of age or older, while only 6 per cent were between the ages of 5 and 15 years, indicating that the number of trees passing through the early bearing period will decrease decidedly in the next few years. Since in addition Jonathan plantings have been light during recent years, it appears that the Jonathan tonnage of the district will increase little, if any, and within a few years may decline.

Average car-lot shipments of **Rome Beauty** from the Yakima district between 1926 and 1930 amounted to 1,772 cars annually which was 13 per cent of the apple shipments of the district. Shipments of this variety increased 33 per cent between 1924 and 1928 (Fig. 32)

There were 236,000 Rome Beauty trees in the district in 1931 which amounted to 11 per cent of the total number of trees. Rome Beauty accounted for less than 4 per cent of the trees under five years of age. The number and percentage of Rome Beauty trees of various ages in the district in 1931 and approximate planting rates were as follows:

Ages	Years planted	Number of trees	Per cent	Approximate annual planting rate
1 and 2 years	1929-1930	4,042	1.7	2,000
3 and 4 years	1927-1928	3,731	1.6	1,900
5 to 10 years	1921-1926	37,163	15.7	6,000
11 to 15 years	1916-1920	13,817	5.9	2,800
16 years and older	1915 and before	177,293	75.1	—
All ages		236,046	100.0	—

Recent plantings of Rome Beauty have been light and have probably been made mostly for pollination purposes. They have not been sufficient to maintain the present number of trees of that variety. Since about three-fourths of the Rome Beauty trees in 1931 were 16 years of age or older, while only about one-fifth were between 5 and

15 years of age, the proportion of the trees passing through the early bearing age is decreasing considerably. Rome Beauty tonnage from the Yakima district, therefore, will probably not increase much in the near future.

Only about 3 per cent of the apple shipments of the Yakima district during recent years have been **Yellow Newtown**, while less than 3 per cent of the trees were of this variety. Since 97 per cent of the Yellow Newtown trees are 16 years of age or older and less than one per cent are under five years of age, there is not much prospect of any large increase in the tonnage of this variety unless plantings should increase.

About 2 per cent of the apple shipments of the Yakima district were **Arkansas Black** between 1926 and 1930. Shipments of this variety increased 46 per cent between 1924-26 and 1928-30. Only 1.2 per cent of the trees in the district were Arkansas Black and less than one per cent of the trees under five years of age were of this variety. About seven-eighths of the Arkansas Black trees were over 16 years of age and only about one per cent were under five years of age. Since so large a proportion of these trees have completed, or soon will have completed, the early bearing age and since plantings are considerably less than enough to maintain the number of trees, little or no increase in production of this variety can be expected.

Other varieties are of minor importance, no other variety accounting for as much as one per cent of the total number of trees.

Subdistricts. About two-thirds of the apple trees in the Yakima district are in the vicinity of Yakima (Subdistrict Y-1). This area has 80 per cent of the trees of the district under five years of age. Trees have been coming into bearing during recent years at the rate of about 47,000 annually in this area. Young trees will come into bearing by 1934 and 1935 at the rate of about 39,000 a year, and in 1936 and 1937 at the rate of 48,000 annually.

Although the rate of planting fluctuates from year to year, it has been on approximately the same level during recent years as it was 10 years ago. This rate appears to be sufficient to maintain the number of bearing trees, and if eliminations are not great, it is enough to gradually increase the number of trees.

Nearly two-thirds of the trees in the area were 16 years of age or older in 1931, and about one-fourth were between 5 and 15 years of age, indicating that the number of trees passing through the early bearing period will decrease somewhat during the next few years. This decrease will to some extent offset the effect of the large number of young trees beginning to bear during the next few years.

In the Upper and Central parts of the Lower Yakima Valley (Subdistrict Y-2 and Y-3), the planting rate increased in 1929 and 1930

over the period immediately preceding. Because of a large number of eliminations, plantings are probably not enough to maintain the number of bearing trees at the present level. In these areas a larger proportion of the trees was in the oldest group than in the vicinity of Yakima; about 82 per cent were 16 years of age or older compared to 65 per cent above the Gap. Conditions in this part of the Lower Valley are such that a continued decrease in apple production may be expected.

The apple trees in the remaining areas in the Yakima District constitute less than 10 per cent of the total number of trees, while the young trees under five years are less than 4 per cent of all the trees of that age in the district. In addition, from 81 to 91 per cent of the trees of the different areas were 16 years of age or older and only 6 to 7 per cent were between five and 15 years of age, showing that the number of trees passing through the early bearing period is materially decreasing.

There are more Winesap trees than of any other variety in all of the Yakima subdistricts except Kittitas county where Jonathan predominates. In the vicinity of Yakima, Delicious is second in importance, Jonathan third, and Rome Beauty fourth; the four varieties account for 93 per cent of the trees. Over two-thirds of the recent plantings in this area have been Delicious, while Delicious and Winesap account for 95 per cent of the young trees under five years of age. Delicious is relatively more important and Winesap relatively less important in the vicinity of Yakima than in the other subdistricts. Jonathan, Rome Beauty, and Yellow Newtown are also varieties of some importance throughout the district. Delicious predominates in recent plantings in all of the areas, and Winesap is second in the Yakima Valley; Jonathan is second in the White Bluffs-Hanford area and Rome Beauty second in Kittitas county.

Young trees being planted at from 55,000 to 65,000 a year will have a tendency to increase apple production in the Yakima district, but this tendency will be partly offset by tree removals and a much smaller number of trees passing through the period when yields increase rapidly. A shift is taking place in production from the Lower Yakima Valley to the Upper Valley; another shift is in progress from lower-priced varieties to Delicious.

A large part of the Washington apple crop must be shipped to distant markets where it competes with apples from other areas and where much lower freight rates are paid. To overcome this disadvantage Washington growers must either produce at a lower cost per unit of product or they must sell fruit for which consumers are willing

to pay higher prices than are paid for local apples. The lower quality Washington apples, bringing no higher prices than those paid for other fruit of the same quality, are at a distinct disadvantage because of the additional expense incurred in getting them to market. Fruit produced at a great distance from market cannot continue to compete with fruit of comparable quality grown much closer to market, unless growing and handling costs are enough lower to compensate for the difference in freight rates. This has caused shifts to take place in the Washington apple industry.

costs are enough lower to compensate for the difference in freight rates. This has caused shifts to take place in the Washington apple industry.

Early in the present century when heavy plantings began in Washington, apple trees were quite widely planted throughout Eastern Washington. All districts did not prove to be equally suited to apple raising and the production of some areas declined.

A shift has been taking place from the areas where production costs are high or a large proportion of the fruit is not of the highest quality, to more advantageously located areas. Production has been increasing rapidly in the Wenatchee-Okanogan and Yakima districts, until during recent years they have furnished over 95 per cent of the apple shipments from the state. Apple production in the other three commercial areas, Spokane, Walla Walla, and White Salmon, has declined; their combined production during recent years having been less than five per cent of total shipments.

Although fewer varieties were planted in the Far Western States than in the older sections of the East and Middle West, early plantings in Washington consisted of many varieties. Some proved more profitable than others and newer plantings consisted of a very few varieties until about three-fourths of the young trees planted during recent years have been Delicious, while Delicious and Winesap combined have accounted for about seven-eighths of the plantings. Recent plantings of other varieties have been little more than sufficient to pollinate the Delicious trees.

The shift in varieties has thus far proven to be an advantage to growers by furnishing more apples of varieties for which consumers will pay a premium. This advantage is decreasing, however, because of the very heavy Delicious plantings in most other apple districts of the United States. If all of the trees of this variety come into bearing as expected, the premium which consumers have been willing to pay for Washington Delicious will undoubtedly be greatly reduced and if production continues to increase the premium may disappear entirely.

APPENDIX of Tables

The foregoing data are based on the following tables.

Table 1. Weighted Average Export Prices of Apples and Adjusted Prices¹, 1789-1931 (In dollars per barrel of three bushels)

Crop year beginning	Price	Adjusted price	Crop year beginning	Price	Adjusted price	Crop year beginning	Price	Adjusted price
1789	\$1.07	—	1837	\$2.04	\$1.85	1885	\$2.43	\$2.93
1790	1.00	—	1838	2.17	1.90	1886	2.34	2.82
1791	—	—	1839	2.36	2.31	1887	2.82	3.32
1792	—	—	1840	1.92	2.09	1888	2.39	2.85
1793	—	—	1841	2.26	2.54	1889	2.72	3.36
1794	—	—	1842	2.13	2.80	1890	3.53	4.25
1795	—	—	1843	2.31	3.00	1891	2.57	3.29
1796	—	—	1844	1.51	1.91	1892	2.69	3.36
1797	—	—	1845	2.24	2.64	1893	3.09	4.23
1798	—	—	1846	2.05	2.38	1894	2.39	3.37
1799	—	—	1847	2.30	2.67	1895	2.58	3.69
1800	—	—	1848	1.97	2.43	1896	1.58	2.36
1801	—	—	1849	2.15	2.59	1897	2.78	3.92
1802	—	—	1850	2.47	2.91	1898	3.18	4.42
1803	—	—	1851	2.37	2.86	1899	2.74	3.38
1804	—	—	1852	2.38	2.56	1900	2.33	2.91
1805	—	—	1853	3.38	3.25	1901	3.54	4.27
1806	—	—	1854	3.17	2.91	1902	2.65	3.01
1807	—	—	1855	1.94	1.81	1903	2.70	3.14
1808	—	—	1856	4.07	3.73	1904	2.57	2.92
1809	—	—	1857	2.68	2.65	1905	3.10	3.48
1810	—	—	1858	3.03	3.19	1906	3.02	3.25
1811	—	—	1859	2.61	2.81	1907	3.49	3.75
1812	—	—	1860	2.39	2.63	1908	3.10	3.26
1813	—	—	1861	3.58	3.85	1909	3.44	3.31
1814	—	—	1862	2.09	1.71	1910	3.36	3.46
1815	—	—	1863	2.65	1.77	1911	3.71	3.79
1816	2.50	\$1.66	1864	4.00	1.94	1912	3.67	3.60
1817	2.25	1.54	1865	4.77	2.71	1913	4.04	4.00
1818	3.00	2.26	1866	4.80	2.81	1914	3.44	3.44
1819	3.00	2.73	1867	4.77	2.98	1915	3.76	3.42
1820	1.60	1.58	1868	—	—	1916	4.59	3.10
1821	2.09	1.95	1869	6.03	4.22	1917	4.43	2.43
1822	1.56	1.50	1870	2.78	2.11	1918	7.67	3.91
1823	1.73	1.73	1871	5.45	4.13	1919	9.10	4.08
1824	1.66	1.66	1872	3.39	2.49	1920	7.06	3.88
1825	1.74	1.69	1873	4.55	3.53	1921	7.64	5.58
1826	1.17	1.18	1874	2.61	2.14	1922	4.51	3.05
1827	1.64	1.71	1875	3.44	3.02	1923	4.68	3.27
1828	1.95	1.99	1876	2.36	2.15	1924	4.52	3.07
1829	1.64	1.80	1877	3.80	3.88	1925	4.87	3.25
1830	1.90	2.07	1878	1.94	2.20	1926	4.94	3.48
1831	2.21	2.33	1879	2.92	2.98	1927	4.99	3.54
1832	1.95	2.07	1880	2.06	2.08	1928	5.03	3.54
1833	1.66	1.80	1881	3.05	2.85	1929	5.94	4.84
1834	2.15	2.31	1882	3.46	3.26	1930	5.31	4.66
1835	1.78	1.66	1883	4.01	4.18	1931	4.42	4.42
1836	1.99	1.69	1884	2.35	2.67			

¹ Adjusted prices were calculated by the use of Warren's Index of wholesale prices, Farm Economics, Cornell University, No. 72, Sept. 1931.

Sources of Data:

1789-1928, U. S. Dept. of Agri., Bur. Agri. Econ., Foreign Trade of the United States, Annual, 1790-1929, Fruits, F. S. 48, May, 1930 (mimeograph).

1929-1931, U. S. Dept. of Agri., Foreign Crops and Markets, Oct. 19, 1931 and Oct., 1932.

Table 2. Index Numbers of Farm Prices of Apples and of All Farm Products, United States, 1910-1930
(Base, Aug. 1909—July, 1914 = 100)

Year	Apples	All farm products
1910	114	103
1911	99	95
1912	86	99
1913	120	100
1914	81	102
1915	92	100
1916	117	117
1917	147	176
1918	178	200
1919	240	209
1920	173	205
1921	252	116
1922	141	124
1923	152	135
1924	158	134
1925	164	147
1926	114	136
1927	183	131
1928	142	139
1929	183	138
1930	133	117

From U. S. Dept. of Agri., Bur. Agri. Econ., Statistics relating to the Apple Industry, Oct. 1931 (mimeograph) p. 25.

Table 3. Prices of Baldwin Apples per Barrel at Boston¹, 1889-1929, and Prices of Apples per Box to Growers in the Wenatchee-Okanogan District, Washington, 1912-1930

Date	Baldwin apples in Boston	Wenatchee-Okanogan	Date	Baldwin apples in Boston	Wenatchee-Okanogan
1889	\$3.24	—	1910	\$3.68	—
1890	4.40	—	1911	2.56	—
1891	1.78	—	1912	2.28	\$.47
1892	2.31	—	1913	3.95	1.17
1893	4.21	—	1914	2.08	.48
1894	2.40	—	1915	2.36	.81
1895	3.10	—	1916	3.44	.91
1896	1.03	—	1917	4.40	1.09
1897	3.23	—	1918	5.94	1.64
1898	3.18	—	1919	6.71	2.02
1899	2.94	—	1920	4.02	1.51
1900	2.28	—	1921	6.69	1.50
1901	4.07	—	1922	4.84	.96
1902	1.93	—	1923	—	.91
1903	2.40	—	1924	5.65	1.66
1904	1.96	—	1925	4.88	1.26
1905	3.59	—	1926	3.42	1.04
1906	2.44	—	1927	6.60	1.72
1907	2.35	—	1928	4.66	1.12
1908	3.99	—	1929	5.12	1.43
1909	2.99	—	1930	—	.93

¹ From U. S. Dept. of Agri., Y.B., 1931, p. 713.

² From I.C.C. Docket 17,000, Application for Reduction of Transportation Rates on Boxed Apples in Carload lots from Pacific Northwest, Ex. No. B, by O. B. Shay, Dec. 1, 1925; Wenatchee Valley Traffic Assn., Bull. 537 and Bert L. Baker, Secy., Wenatchee Valley Traffic Assn., May, 1932.

Table 4. Exports of Fresh Apples, 1889-1931 (In thousand bushels)

Year beginning July 1	Exports	Year beginning July 1	Exports
1889	1,361	1910	5,163
1890	406	1911	4,369
1891	2,816	1912	6,450
1892	1,224	1913	4,520
1893	236	1914	7,055
1894	2,456	1915	4,399
1895	1,080	1916	5,220
1896	4,512	1917	1,906
1897	1,816	1918	4,729
1898	1,140	1919	3,152
1899	1,580	1920	7,995
1900	2,651	1921	3,282
1901	1,379	1922	5,269
1902	4,968	1923	12,295
1903	6,055	1924	9,604
1904	4,500	1925	11,015
1905	3,627	1926	21,293
1906	4,618	1927	9,430
1907	3,149	1928	21,043
1908	2,689	1929	10,279
1909	2,766	1930	20,341
		1931	18,031

Sources of Data:

1889-1929, U. S. Dept. of Agri., Y. B. 1931, p. 713.
 1930-1931, U. S. Dept. of Agri., Foreign Crops and Markets, Oct. 3, 1932,
 p. 496.

Table 5. Amount and Percentage of Fresh Apples Exported from the United States to Various Foreign Countries (Average, 1926-1930)

Country	1000 boxes	Per cent	1000 barrels	Per cent	Total 1000 bushels	Per cent
United Kingdom	3554	41.1	1597	61.3	8344	50.6
Germany	1777	20.5	230	8.8	2466	15.0
Netherlands	989	11.4	150	5.8	1440	8.7
France	137	1.6	49	1.9	284	1.7
Belgium	28	.3	159	6.1	506	3.1
Sweden	237	2.8	80	3.1	478	2.9
Norway	93	1.1	22	.8	159	1.0
Denmark	159	1.8	76	2.9	387	2.3
Other Europe	72	.8	14	.5	112	.7
Total Europe	7046	81.4	2377	91.2	14177	86.0
Canada	577	6.7	71	2.7	790	4.8
Mexico	85	1.0	2	.1	92	.5
Cuba	64	.7	11	.4	96	.6
Brazil	172	2.0	3	.1	180	1.1
Argentina	254	2.9	127	4.9	635	3.9
Other Countries	462	5.3	15	.6	506	3.1
Total	8660	100.0	2606	100.0	16477	100.0

Data from Op. Cit. Table 2.

Table 6. Production of Certain Fruits in the United States that Compete with Apples in the Markets and Net Imports of Bananas into the United States, 1909-1931

Crop year	Apples (million bushels)	Pears (million bushels)	Peaches (million bushels)	Oranges (million boxes)	Grapes (thousand tons)	Dried prunes (million pounds)	Bananas net imports (million bunches)
1909	145	9	35	20	1,286	—	37
1910	142	10	48	—	—	—	43
1911	214	11	35	—	—	193	43
1912	235	12	52	—	—	213	41
1913	145	10	40	—	—	124	46
1914	253	12	54	—	—	123	39
1915	230	11	64	—	—	203	35
1916	194	12	38	—	—	200	33
1917	167	13	49	—	—	241	33
1918	170	13	33	—	—	151	34
1919	142	15	53	23	1,258	315	35
1920	224	17	46	30	—	230	39
1921	99	11	33	21	—	227	44
1922	203	21	56	31	2,076	336	42
1923	203	18	45	37	2,227	312	43
1924	172	19	54	30	1,778	328	48
1925	172	21	47	34	2,202	316	56
1926	247	25	70	39	2,438	381	54
1927	124	18	45	32	2,605	489	61
1928	187	24	68	54	2,671	446	61
1929	136	21	45	34	2,080	—	65
1930	156	26	54	55	2,439	—	57
1931	212	23	78	51	1,583	—	—

Sources of Data:

Apples, Table 7.
 1909-1927, Pears, peaches, and grapes, U. S. Dept. of Agri. Statistics and Charts of the Apple Industry, March 1930, (mimeograph), p. 5.
 1909-1928, Oranges and dried prunes, Ibid.; Bananas, U. S. Dept. of Agri., Foreign Trade of the United States, Annual 1790-1929, Fruits, F. S. 48, May, 1930, (mimeograph), p. 25.
 1928, U. S. Dept. of Agri., Y. B. 1931, Pears p. 738; Peaches p. 735; Grapes p. 732.
 1929-1931, U. S. Dept. of Agri., Crops and Markets, Dec. 1931, Pears and Peaches, p. 515; Oranges p. 516; Grapes p. 514; Bananas, Monthly Summaries of Foreign Commerce, Part II, June of each year.

Table 7. Total Apple Production, United States, Box States, and Barrel States, 1889-1931¹

Date	United States	Box States	Barrel States	Date	United States	Box States	Barrel States
(Millions of Bushels)				(Millions of Bushels)			
1889	143	3	140	1912	235	25	210
1890	80	4	76	1913	145	20	125
1891	199	5	194	1914	253	27	226
1892	121	4	116	1915	230	21	209
1893	115	6	109	1916	194	33	161
1894	135	6	129	1917	167	40	127
1895	220	7	213	1918	170	32	137
1896	233	5	228	1919	142	51	92
1897	164	9	154	1920	224	40	183
1898	118	9	109	1921	99	53	46
1899	175	6	169	1922	203	51	152
1900	206	9	197	1923	203	64	139
1901	136	9	127	1924	172	44	127
1902	212	11	201	1925	172	53	120
1903	196	11	184	1926	247	63	184
1904	234	13	221	1927	124	47	76
1905	136	11	125	1928	187	65	122
1906	217	14	202	1929	136	51	84
1907	120	12	108	1930	156	64	92
1908	149	14	135	1931	212	54	158
1909	145	15	130	FIVE YEAR AVERAGES			
1910	142	18	123	1911-1915	216	22	194
1911	214	16	198	1927-1931	163	56	106

¹ Apparent error in cross totals are due to rounding figures to millions.

Sources of Data:

1889-1924, U. S. Dept. of Agri., Statistics and Charts of the Apple Industry, March, 1930, (mimeograph), pp. 19-26.

1925-1928, U. S. Dept. of Agri., Y. B., 1931, p. 713.

1929-1931, U. S. Dept. of Agri. Crops and Markets, Dec., 1931, p. 513.

Table 8. Averages of Total Production of Apples by Five-year Periods Except 1929-1931, United States and Geographic Divisions, 1889-1931
(In thousands of bushels)

Years of average	United States	Box States	Barrel States	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain States	Pacific States
1889 to 1893	131,493	4,589	126,904	11,804	30,936	22,718	27,934	14,852	15,807	2,853	498	4,091
1894 to 1898	173,727	7,278	166,449	16,309	46,869	22,484	41,633	20,222	14,799	4,133	1,155	6,123
1899 to 1903	184,968	9,401	175,567	16,060	54,663	25,176	41,110	20,304	14,065	4,189	1,859	7,542
1904 to 1908	171,014	13,020	157,994	14,410	52,780	21,470	31,840	21,100	11,744	4,650	3,400	9,620
1909 to 1913	176,340	18,999	157,341	12,942	44,193	24,509	33,416	23,952	13,431	4,898	6,132	12,867
1914 to 1918	202,698	30,784	171,914	12,366	52,973	32,108	35,578	20,350	14,014	4,525	7,011	23,773
1919* to 1923	174,062	51,589	122,473	9,278	38,917	20,933	29,808	12,483	6,372	4,682	10,443	41,146
1924 to 1928	180,262	54,428	125,834	9,455	38,598	30,093	25,033	9,396	8,757	4,002	10,006	44,422
1929 to 1931	167,703	55,441	111,262	7,991	32,533	30,712	23,360	8,146	5,632	2,888	9,262	47,179

Source of Data:
Op. Cit. Table 7.

Table 9. Apple Production in Washington by Districts, 1909, 1919, 1924, and 1929

Year	Washington	Wenatchee- Okanogan	Yakima	Spokane	Walla Walla	White Salmon	Western Washington
(Thousands of bushels)							
1909	2672	611	349	576	149	24	963
1919	21569	9300	7645	2198	727	393	1305
1924	17890	8539	6219	1414	155	765	797
1929	25782	13417	10150	802	606	206	601
Per Cent of Total							
1909	100.0	22.9	13.0	21.6	5.6	0.9	36.0
1919	100.0	43.1	35.4	10.2	3.4	1.8	6.1
1924	100.0	47.7	34.8	7.9	0.9	4.3	4.4
1929	100.0	52.0	39.4	3.1	2.4	0.8	2.3

Note: Apparent errors in cross totals are due to rounding of figures to nearest thousand.

Source of data:
U. S. Census.

Table 10. Commercial Apple Production, United States and Geographic Divisions 1916-1931

Year	United States	Box States	Barrel States	New Eng- land	Middle Atlan- tic	South Atlan- tic	East North Central	West North Central	East South Central	West South Central	Moun- tain States	Pacif States
(Thousands of bushels)												
1916	80,241	23,799	56,442	4,989	21,693	12,357	10,812	4,812	903	876	3,198	20,611
1917	67,023	25,590	41,433	2,976	9,960	9,447	9,456	7,029	1,107	1,458	6,069	19,511
1918	74,229	21,309	52,920	2,643	22,740	10,980	10,842	3,852	1,056	807	3,027	18,211
1919	78,477	36,300	42,177	4,752	12,570	8,280	6,861	5,772	402	3,540	7,128	29,111
1920	101,715	29,190	72,525	3,765	26,685	12,906	20,052	5,469	1,326	2,322	5,802	23,311
1921	64,671	41,976	22,695	3,399	10,959	981	6,414	495	273	174	8,019	31,911
1922	95,835	37,968	57,867	3,204	23,304	9,816	12,405	6,573	846	1,719	7,968	30,011
1923	107,808	49,716	58,092	4,797	17,808	12,930	14,961	5,121	336	2,139	9,366	40,111
1924	84,039	33,171	50,868	6,408	15,390	13,113	9,111	3,720	804	2,322	5,376	27,111
1925	99,738	43,041	56,697	6,192	23,604	9,339	11,850	3,342	333	2,037	9,852	33,111
1926	117,384	44,448	72,936	6,504	26,220	21,471	12,684	3,588	876	1,593	7,104	37,311
1927	78,051	38,607	39,444	4,905	12,546	11,613	6,690	2,865	156	669	8,724	29,311
1928	106,383	51,012	55,371	4,437	18,057	19,227	9,159	2,496	720	1,275	9,051	41,911
1929	86,529	39,747	46,782	5,184	14,211	16,350	7,398	2,616	297	726	8,397	31,511
1930	101,004	51,915	49,089	6,684	22,908	9,408	7,494	1,584	210	801	7,326	44,311
1931	104,196	38,421	65,775	3,327	19,413	19,353	15,876	4,431	858	2,517	6,474	31,911
Average:												
1916-1920	80,337	27,238	53,099	3,825	18,730	10,794	11,605	5,387	959	1,801	5,045	22,111
1927-1931	95,233	43,940	51,292	4,907	17,427	15,190	9,323	2,798	448	1,198	7,994	35,311

Note: Apparent errors in cross totals are due to rounding figures to thousands.

Sources of data:

All from U. S. Dept. of Agri.

1916, Y. B., 1920, p. 653.

1917-25, Statistics and Charts of the Apple Industry, pp. 29-30.

1926-28, Y. B., 1931, p. 714.

1929-31, Crops and Markets, Dec., 1931, p. 513.

Table 11. Total Production of Apples, 1889-1931, Commercial Production and Car-lot Shipments, Washington, 1916-1931.

Crop Year	Total production (1,000 bushels)	Crop Year	Total production (1,000 bushels)	Commercial production (1,000 bushels) (1)	Car-lot shipments (Carloads) (1)
1889	295	1911	3,500	—	—
1890	522	1912	7,700	—	—
		1913	6,900	—	—
1891	693	1914	8,300	—	—
1892	611	1915	7,300	—	—
1893	821				
1894	819	1916	17,658	14,676	14,426
1895	1,146	1917	19,830	13,860	15,337
		1918	16,491	12,888	16,232
1896	972	1919	25,295	21,501	27,023
1897	1,700	1920	21,502	17,202	22,213
1898	2,058				
1899	729	1921	29,062	24,900	33,355
1900	1,950	1922	25,775	22,023	28,291
		1923	33,000	28,800	37,633
1901	1,870	1924	22,000	18,825	25,156
1902	2,300	1925	29,550	26,010	35,046
1903	2,600				
1904	2,700	1926	34,030	25,950	34,729
1905	2,500	1927	25,343	22,302	30,280
		1928	33,500	30,000	41,317
1906	3,000	1929	29,500	24,687	34,220
1907	3,800	1930	37,850	33,597	45,217
1908	3,200				
1909	2,672	1931	31,400	25,200	34,566
1910	5,800				

¹ No data previous to 1916.

Sources of data:

Total Production Op. Cit. Table 7.

Commercial Production, Op. Cit. Table 10.

Car-lot Shipments, Op. Cit. Table 13.

Table 12. Average Yield of Apples per Tree by Five-year Periods, United States and Geographic Divisions, 1907-1931
(Bushels per Tree)

	United States	Box States	Barrel States	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain States	Pacific States
1911	1.02	1.25	1.00	1.55	2.21	1.08	0.78	0.57	0.83	0.33	0.94	1.43
1921	1.39	2.03	1.24	1.50	2.20	1.03	1.10	0.86	0.88	0.71	1.30	2.38
1926	1.92	3.00	1.69	1.65	2.55	1.38	1.61	1.48	1.29	1.22	2.02	3.39
1931	1.83	4.21	1.41	1.65	1.92	1.44	1.24	1.06	0.98	0.85	2.66	4.80

Notes of data:

Calculated by dividing five-year average production centered at census year by the number of bearing trees in that census year.

Number of trees from Table 19.

Production, Op. Cit. Table 7.

Table 13. Car-lot Shipments of Apples, United States and Geographic Divisions,
1916-1931
(In carloads)

Year	United States	Box States	Barrel States	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain States	Pacific States
1916	57,783	22,377	35,406	2,192	12,461	11,675	4,837	2,759	139	1,343	3,088	19,298
1917	58,406	27,670	30,736	2,003	7,781	6,960	7,489	4,772	166	1,565	6,755	20,911
1918	69,627	25,591	44,036	764	25,630	8,497	6,150	1,769	151	1,075	3,640	21,351
1919	86,748	45,407	41,341	3,569	12,106	11,221	6,642	3,132	48	4,623	8,871	36,550
1920	116,117	37,277	78,840	1,540	40,095	17,171	12,905	3,081	161	3,887	7,386	29,899
1921	89,559	56,871	32,688	5,166	18,207	1,624	7,377	228	49	37	11,866	45,000
1922	113,961	46,290	67,671	937	32,577	12,932	13,223	5,137	213	2,652	9,143	37,114
1923	138,184	63,005	75,179	1,589	24,866	21,383	17,964	6,468	83	2,826	12,439	50,536
1924	103,844	41,573	62,271	3,851	18,467	20,471	10,833	4,870	246	3,483	6,011	35,556
1925	127,804	55,302	72,502	2,494	32,426	15,020	14,418	4,792	98	3,254	13,023	42,237
1926	133,550	54,371	79,179	1,837	27,008	31,522	13,326	3,188	439	1,859	8,136	46,211
1927	93,094	48,679	44,415	2,280	13,736	19,173	5,870	2,562	122	672	10,983	37,611
1928	127,530	64,822	62,708	1,341	16,821	30,478	10,204	2,451	144	1,269	10,758	54,000
1929	102,801	51,362	51,439	2,568	11,985	27,104	7,598	1,607	140	437	11,000	40,311
1930	109,794	66,538	43,256	3,278	19,100	13,738	5,829	880	63	368	9,743	56,711
1931	101,674	47,529	54,145	866	12,544	27,151	9,990	2,959	292	343	6,979	40,511
Average:												
1916-1920	77,736	31,664	46,072	2,014	19,615	11,105	7,605	3,103	133	2,499	5,948	25,711
1926-1930	113,353	57,154	56,199	2,261	17,730	24,403	8,565	2,138	182	921	10,124	47,011

Sources of data:

1916-17, U. S. Dept. of Agri., Market News Service, The Northwest Boxed Apple Data, Sept., 1924.

1918-24, Statistics and Charts of the Apple Industry, Op. Cit.

1925-31, U. S. Dept. of Agri., Market News Service, Marketing Northwest Apples, season 1930-31 and 1931-22.

Table 14. Car-lot Shipments of Apples, Washington by Districts, 1921-1931

(In carloads)

	Wash- ington	Wenatchee- Okanogan District	Yakima District	Spokane District	Walla Walla District	White Salmon District	Western Wash- ington Counties
1921-22	33,089	15,131	13,354	2,452	1,450	702	—
1922-23	28,228	14,646	9,851	3,056	172	503	—
1923-24	37,585	18,376	16,040	1,258	1,206	705	—
1924-25	25,264	13,537	9,315	1,442	172	798	1
1925-26	34,591	16,844	15,336	781	1,074	506	—
1926-27	34,729	17,368	15,100	909	552	800	—
1927-28	30,269	15,700	12,061	1,382	320	306	—
1928-29	41,309	21,837	16,696	1,409	704	663	—
1929-30	34,204	19,312	13,327	820	537	208	—
1930-31	45,217	24,611	18,988	676	491	451	—
1931-32	34,511	19,782	13,326	787	373	243	—
Five-year average:							
1921-1925	31,752	15,707	12,789	1,798	815	643	—
1926-1930	37,146	19,766	15,235	1,039	621	486	—

Sources of Data:

Tabulated from U. S. Dept. of Agri., Market News Service, The North-western Box Apple Deals for Seasons 1922-23, 1923-24, 1924-25, 1925-26; and Marketing Northwestern Apples, Summaries of Seasons 1926-27, 1928-29, 1929-30, 1930-31, and 1931-32.

Table 15. Car-lot shipments of Apples, Wenatchee-Okanogan District by Subdistricts, 1921-1931

(In carloads)

Year beginning July 1	Wenatchee- Okanogan District	W-1	W-2	W-3	W-4	W-5	W-4 & W-5	W-6
1921	15,131	6,317	3,683	1,628	1,024	1,850	2,874	629
1922	14,646	4,423	3,670	2,098	981	2,474	3,455	1,900
1923	18,376	7,629	4,813	2,150	980	1,930	2,910	874
1924	13,537	4,563	3,763	2,778	632	1,247	1,879	554
1925	16,844	6,155	4,233	2,155	1,067	2,065	3,132	1,169
1926	17,368	6,076	4,137	2,874	1,191	2,007	3,198	1,083
1927	15,700	5,882	3,610	2,428	1,216	1,886	3,102	678
1928	21,837	7,203	5,496	3,642	1,426	3,158	4,584	912
1929	19,312	7,099	4,679	3,022	1,169	2,072	3,241	1,271
1930	24,611	9,652	4,952	4,413	1,937	2,186	4,123	1,471
1931	19,782	7,082	4,366	3,545	1,295	2,342	3,637	1,152
Five-year average:								
1921-1925	15,707	5,818	4,032	2,162	937	1,913	2,850	845
1926-1930	19,766	7,182	4,575	3,276	1,388	2,260	3,648	1,083

Source of data:

Op. Cit. Table 14.

Table 16. Car-lot Shipments of Apples from the Yakima District by Subdistricts, 1921-1931
(In carloads)

Year beginning July 1	Yakima District	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6
1921	13,354	7,906	2,681	1,616	727	308	116
1922	9,851	6,755	1,664	755	318	242	117
1923	16,040	9,444	3,061	1,855	1,155	417	108
1924	9,315	7,058	1,361	487	252	83	74
1925	15,386	8,646	3,330	1,840	892	490	188
1926	15,100	9,687	2,594	1,405	950	405	59
1927	12,061	9,354	1,336	791	209	152	219
1928	16,696	11,143	2,445	1,415	1,154	383	156
1929	13,327	9,343	1,844	1,006	555	442	137
1930	18,988	12,867	2,823	1,298	1,250	617	133
1931	13,326	10,429	1,545	761	306	189	96
Five-year average:							
1921-1925	12,789	7,962	2,419	1,311	669	308	120
1926-1930	15,235	10,479	2,208	1,183	824	400	141

Sources of data:

Op. Cit. Table 14.

Table 17. Car-lot Shipments of Apples from Wenatchee-Okanogan District, Washington, by Varieties, 1921-1931¹
(In carloads)

Year beginning July 1	Winesap	Delicious	Jona-than	Rome Beauty	Yellow New-town	Stay-man	Esopus Spitz-enberg	Winter Banana	Arkansas Black	W. W. Pear-main	Other Varieties	Total
1921	4,468	1,666	2,378	1,253	264	1,065	1,314	208	131	192	1,184	14,123
1922	4,233	2,337	2,313	1,028	178	1,092	1,299	167	119	204	877	13,847
1923	5,957	2,958	3,125	1,601	215	1,166	974	300	177	226	1,165	17,864
1924	5,089	1,611	1,743	1,068	157	990	1,015	236	75	177	483	12,644
1925	5,811	3,051	2,497	1,393	154	1,187	536	255	150	213	756	16,003
1926	5,803	3,397	2,968	1,227	145	931	1,202	341	156	184	490	16,844
1927	5,777	2,715	2,186	1,642	241	908	601	274	148	127	458	15,077
1928	7,313	4,595	2,951	1,623	254	1,324	1,276	496	172	206	499	20,709
1929	7,651	4,392	1,701	1,307	160	1,163	433	280	113	135	392	17,727
1930	8,278	5,532	3,323	1,973	240	1,557	968	484	193	235	701	23,484
1931	7,841	4,504	2,404	1,617	141	1,309	481	276	147	135	192	19,047
Five-year average:												
1921-25	5,112	2,325	2,411	1,268	194	1,100	1,028	233	130	202	893	14,896
1926-30	6,965	4,126	2,626	1,554	208	1,177	896	375	156	177	508	18,768

¹ The slight variation from Wenatchee Valley Traffic Association figures is due to dropping decimals. These data omit mixed cars and, therefore, vary slightly from U. S. Dept. of Agri. data.

Sources of data:
1921-1929, Wenatchee Valley Traffic Association, History of the Wenatchee Valley Traffic Association, p. 15.
1930-31, Wenatchee Valley Traffic Association Bul. No. 642, Aug. 1932.

Table 18. Car-lot Shipments of Apples from the Yakima District, Washington, by Varieties, 1924-1931
(In carloads)

Year beginning July 1	Winesap	Delicious	Jona-than	Rome Beauty	Yellow New-town	Stay-man	Esopus Spitz-enberg	Winter Banana	Arkansas Black	W. W. Pear-main	Other Varieties	Total
1924	3,839	435	1,513	1,238	372	193	211	36	99	32	606	8,574
1925	7,032	821	2,839	1,743	447	216	86	101	245	29	850	14,409
1926	6,046	950	3,405	1,280	436	144	172	92	317	—	357	13,199
1927	5,506	671	2,364	1,920	349	129	85	36	265	18	319	11,662
1928	6,541	1,496	2,963	1,848	587	161	205	88	337	29	410	14,665
1929	6,414	1,452	1,612	1,339	253	134	38	29	251	—	432	11,954
1930	6,696	2,260	3,899	2,474	563	216	114	90	377	—	614	17,303
1931	5,718	1,433	2,215	1,559	449	137	46	44	281	—	250	12,132
Three-year average:												
1924-1926	5,639.0	735.3	2,585.7	1,420.3	418.3	184.3	156.3	76.3	220.3	20.3	604.3	12,060
1928-1930	6,550.3	1,736.0	2,824.7	1,887.0	467.7	170.3	119.0	69.0	321.7	9.7	485.3	14,641

Note: Figures of the Traffic Associations differ slightly from those of the U. S. Dept. of Agri. because of differences in methods of gatehiring data.

Sources of data:
1924-1927, Records of the Yakima Valley Traffic and Credit Association; 1928, Yakima Valley Traffic and Credit Association Bul. No. 17, Aug. 30, 1929; 1929, Ibid. Bul. No. 1, July 3, 1930; 1930 Wenatchee Valley Traffic Association, Bul. No. 588, July 31, 1931, 1931, Ibid. Bul. No. 642, Aug. 12, 1932.

Table 19. Number of Bearing and Non-Bearing Apple Trees, United States and Geographic Divisions, 1910, 1920, 1925, and 1930

	United States	Box States	Barrel States	New England	Middle Atlantic	South Atlantic
1910	(thousands of trees)					
Non-bearing	65,792	14,837	50,955	2,095	5,849	10,065
Bearing	151,323	12,137	139,186	8,219	20,302	20,674
Total	217,115	26,974	190,141	10,314	26,151	30,739
1920						
Non-bearing	36,195	3,124	33,071	2,124	6,372	8,052
Bearing	115,309	21,203	94,107	6,352	17,775	20,777
Total	151,504	24,327	127,178	8,476	24,147	28,829
1925						
Non-bearing	34,299	2,674	31,625	1,958	5,328	6,486
Bearing	103,697	18,272	85,425	5,891	17,617	21,483
Total	137,996	20,946	117,050	7,849	22,945	27,969
1930						
Non-bearing	27,452	2,077	25,375	1,779	4,199	4,384
Bearing	88,844	13,367	75,477	4,799	16,059	20,064
Total	116,296	15,444	100,852	6,578	20,258	24,448
	East North Central	West North Central	East South Central	West South Central	Mountain States	Pacific States
1910	(thousands of trees)					
Non-bearing	10,610	9,725	5,387	7,225	6,679	8,157
Bearing	34,135	31,745	12,273	11,838	4,615	7,522
Total	44,745	41,470	17,660	19,063	11,294	15,679
1920						
Non-bearing	7,678	4,166	3,093	1,587	724	2,400
Bearing	22,449	12,507	8,239	6,008	6,794	14,408
Total	30,127	16,673	11,332	7,595	7,518	16,808
1925						
Non-bearing	8,323	3,980	3,246	2,305	480	2,194
Bearing	20,016	9,341	7,154	3,923	5,177	13,096
Total	28,339	13,321	10,400	6,228	5,657	15,290
1930						
Non-bearing	6,350	4,233	2,680	1,750	436	1,640
Bearing	17,678	7,706	6,088	3,084	3,662	9,705
Total	24,028	11,939	8,768	4,834	4,098	11,345

Note: Apparent errors in cross totals are due to rounding of figures to thousands.

Sources of Data:

U. S. Dept. of Agri., Statistics and Charts of the Apple Industry, Mar. 1930;
and U. S. Bureau of Census, Census of Agriculture, 1930.

**Table 20. Number of Apple Trees of Bearing and Non-Bearing Age,
Washington by Districts, 1910, 1920, 1925, and 1930**
(thousands of trees)

	Wash- ington	Wenatchee- Okanogan	Yakima	Spokane	Walla Walla	White Salmon	Western Washington
1910							
Non-bearing	4863	—*	—*	—*	—*	—*	—*
Bearing	3009	498	446	941	126	60	939
Total	7872	—	—	—	—	—	—
1920							
Non-bearing	756	291	181	123	19	33	110
Bearing	7964	2697	2387	1537	241	263	839
Total	8720	2988	2568	1660	260	296	949
1925							
Non-bearing	1050	413	421	55	25	20	116
Bearing	6782	2263	2325	1048	199	283	665
Total	7832	2676	2746	1103	224	303	781
1930							
Non-bearing	948	483	347	43	11	14	51
Bearing	5194	1996	2118	367	116	113	484
Total	6142	2479	2465	410	127	127	535

Note: Apparent errors in cross totals are due to rounding of figures to thousands.

* Data on non-bearing trees not available by counties.

Sources of data:

U. S. Bureau of Census, Census of Agriculture for 1910, 1920, 1925, and 1930.

Table 21. Estimated Number and Percentage of Apple Trees of Various Ages in Commercial Orchards, United States, and Geographic Divisions, Jan. 1, 1928

Age	United States	Box States	Barrel States	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain States	Pacific States
					(thousand trees)							
3 years and less	6,377	566	5,811	476	1,390	744	1,075	980	498	648	130	436
4 to 8 years	15,996	1,419	14,577	948	3,055	3,009	3,622	1,582	1,108	1,253	279	1,140
9 to 13 years	10,617	982	9,635	854	1,784	2,805	2,811	645	421	315	236	746
14 to 18 years	20,243	7,502	12,741	930	3,439	5,122	2,077	449	499	225	1,913	5,589
19 to 23 years	10,231	3,170	7,061	424	1,526	2,217	1,552	579	247	516	819	2,351
24 to 28 years	7,661	973	6,688	383	1,173	1,680	1,367	957	334	794	317	656
29 to 33 years	3,246	465	2,781	342	627	729	602	364	47	70	188	277
34 to 38 years	2,992*	194	2,798*	1,218*	490*	361	411	213	59	46	43	151
39 to 43 years	1,032†	130	902†	—	417†	165	284	19	16	1	32	98
44 years and older	2,410†	100	2,310†	—	1,607†	293	363	5	39	3	5	95
Total (all ages)	80,805	15,501	65,304	5,575	15,508	17,125	14,164	5,793	3,268	3,871	3,962	11,539
Percentage of Total												
	%	%	%	%	%	%	%	%	%	%	%	%
3 years and less	7.9	3.7	8.9	8.5	9.0	4.3	7.6	16.9	15.2	16.8	3.3	3.8
4 to 8 years	19.8	9.2	22.3	17.0	19.7	17.6	25.6	27.3	33.9	32.4	7.0	9.9
9 to 13 years	13.1	6.3	14.8	15.3	11.5	16.4	19.8	11.1	12.9	8.1	6.0	6.5
14 to 18 years	25.0	48.4	19.5	16.7	22.2	29.9	14.7	7.8	15.3	5.8	48.3	48.4
19 to 23 years	12.7	20.4	10.8	7.6	9.8	12.9	11.0	10.0	7.6	13.3	20.7	20.4
24 to 28 years	9.5	6.3	10.2	6.9	7.6	9.8	9.7	16.5	10.2	20.5	8.0	5.7
29 to 33 years	4.0	3.0	4.3	6.1	4.0	4.3	4.2	6.3	1.4	1.8	4.7	2.4
34 to 38 years	3.7*	1.3	4.3*	21.9*	3.1*	2.1	2.9	3.7	1.8	1.2	1.1	1.3
39 to 43 years	1.3†	0.8	1.4†	—	2.7†	1.0	2.0	0.3	0.5	—	0.8	0.8
44 years and older	3.0†	0.6	3.5†	—	10.4†	1.7	2.5	0.1	1.2	0.1	0.1	0.8
Total (all ages)	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.

* Includes trees 34 years and over in New England and New Jersey.

† Does not include trees 34 years and over in New England and New Jersey.

Source of data:

U. S. Dept. of Agrl., Y. B., 1931, p. 719.

Table 22. Estimated Number and Percentage of Apple Trees of Various Ages in Commercial Orchards, Washington by Districts, Jan. 1, 1928

	Wash- ington	Wenatchee- Okanogan	Yakima	Spokane	Walla Walla	White Salmon	Western Washington
3 years and younger	318,400	90,761	153,404	54,990	5,212	5,873	8,160
4 to 13 years	1,095,700	458,667	492,208	52,899	29,992	10,929	51,005
14 to 23 years	4,684,900	1,830,968	1,768,951	579,106	145,105	256,665	104,105
24 to 33 years	226,000	97,898	51,001	16,739	3,342	534	56,486
34 to 43 years	34,500	1,092	171	4,707	—	—	28,530
44 to 53 years	7,800	—	—	—	—	—	7,800
54 years and older	200	—	—	—	—	—	200
Total	6,367,500	2,479,386	2,465,735	708,441	183,651	274,001	256,286
Percentage							
	%	%	%	%	%	%	%
3 years and younger	5.0	3.7	6.2	7.7	2.9	2.1	3.2
4 to 13 years	17.2	18.5	20.0	7.5	16.3	4.0	19.9
14 to 23 years	73.6	73.8	71.7	81.7	79.0	93.7	40.6
24 to 33 years	3.6	4.0	2.1	2.4	1.8	.2	22.0
34 to 43 years	.5	—	—	.7	—	—	11.1
44 to 53 years	.1	—	—	—	—	—	3.1
54 years and older	—	—	—	—	—	—	.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source of data:

U. S. Dept. of Agri., Estimated Number of Apple Trees by Varieties and Ages in Commercial and Farm Orchards in Washington, Jan. 1, 1928, (mimeograph), Jan. 1931, Table 4.

Table 23. Number and Percentage of Apple Trees of Various Ages with Dates of Planting, Washington by Districts, 1931

Age of trees in 1931	Years Planted	Wash- ington	Wenatchee- Okanogan	Yakima	Spokane	Walla Walla	White Salmon	Western Wash- ington
and 2 years	1929 and 1930	390,230	242,855	128,268	6,844	4,019	4,683	3,561
and 4 years	1927 and 1928	295,454	161,504	90,232	30,198	4,658	5,025	3,837
to 10 years	1921 to 1926	708,639	318,666	331,514	20,422	16,332	2,726	23,979
11 to 15 years	1916 to 1920	208,063	74,327	84,415	685	11,893	6,680	30,063
6 years and older	1915 and before	3,675,400	1,583,788	1,544,664	229,522	82,447	102,801	132,178
All Ages		5,277,786	2,376,140	2,179,093	287,671	119,340	121,915	193,618
Percentage								
		%	%	%	%	%	%	%
and 2 years	1929 and 1930	7.4	10.2	5.9	2.4	3.4	3.9	1.8
and 4 years	1927 and 1928	5.6	6.8	4.1	10.5	3.9	4.1	2.0
to 10 years	1921 to 1926	13.4	13.2	15.2	7.1	13.7	2.2	12.4
11 to 15 years	1916 to 1920	4.0	3.1	3.9	0.2	10.0	5.5	15.5
16 years and older	1915 and before	69.6	66.7	70.9	79.8	69.0	84.3	68.3
All ages		100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source of data:

Washington Dept. of Agriculture, Division of Horticulture, State Orchard Census, 1931 and files of the Department.

Table 24. Number and Percentage of Apple Trees of Various Ages in 1931, and Recent Approximate Annual Planting Rates, Wenatchee-Okanogan District by Subdistricts

Ages of trees	Years planted	Number of trees	Percentage of trees in subdistrict	Approximate annual planting rate
Subdistrict W-1				
1 and 2 years	1929 and 1930	30,800	5.7	15,400
3 and 4 years	1927 and 1928	23,725	4.4	11,800
5 to 10 years	1921 to 1926	42,384	7.8	7,100
11 to 15 years	1916 to 1920	22,830	4.2	4,600
16 years and older	1915 and before	423,176	77.9	—
All Ages		542,915	100.0	—
Subdistrict W-2				
1 and 2 years	1929 and 1930	40,754	8.1	20,400
3 and 4 years	1927 and 1928	27,757	5.5	13,900
5 to 10 years	1921 to 1926	54,344	10.8	9,000
11 to 15 years	1916 to 1920	18,234	3.6	3,600
16 years and older	1915 and before	362,780	72.0	—
All Ages		503,869	100.0	—
Subdistrict W-3				
1 and 2 years	1929 and 1930	56,809	12.1	28,400
3 and 4 years	1927 and 1928	49,595	10.6	24,800
5 to 10 years	1921 to 1926	89,867	19.1	15,000
11 to 15 years	1916 to 1920	19,070	4.1	3,800
16 years and older	1915 and before	253,850	54.1	—
All Ages		469,191	100.0	—
Subdistrict W-4				
1 and 2 years	1929 and 1930	35,942	16.6	18,000
3 and 4 years	1927 and 1928	18,454	8.6	9,200
5 to 15 years*	1916 to 1926	24,243	11.2	2,200
16 years and older	1915 and before	137,549	63.6	—
All Ages		216,188	100.0	—
Subdistrict W-5				
1 and 2 years	1929 and 1930	62,732	14.6	31,400
3 and 4 years	1927 and 1928	38,004	8.8	19,000
5 to 15 years*	1916 to 1926	98,986	23.0	9,000
16 years and older	1915 and before	230,863	53.6	—
All Ages		430,585	100.0	—
Subdistrict W-4 and W-5				
1 and 2 years	1929 and 1930	98,674	15.3	49,000
3 and 4 years	1927 and 1928	56,458	8.7	28,200
5 to 15 years*	1916 to 1926	123,229	19.0	11,200
16 years and older	1915 and before	368,412	57.0	—
All Ages		646,773	100.0	—
Subdistrict W-6				
1 and 2 years	1929 and 1930	15,818	7.5	7,900
3 and 4 years	1927 and 1928	3,969	1.9	2,000
5 to 10 years	1921 to 1926	7,302	3.4	1,200
11 to 15 years	1916 to 1920	10,719	5.1	2,100
16 years and older	1915 and before	174,006	82.1	—
All Ages		211,814	100.0	—

* Discrepancies in original data^a make necessary the combination of age groups 5 to 10 years and 11 to 15 years for Subdistricts W-4 and W-5.

Source of Data:

Op. Cit. Table 23.

Table 25. Number and Percentage of Apple Trees of Various Ages in 1931, and Recent Approximate Annual Planting Rates, Yakima District by Subdistricts

Ages of trees	Years planted	Number of trees	Percentage of trees in subdistrict	Approximate annual planting rate
Subdistrict Y-1				
1 and 2 years	1929 and 1930	96,794	6.6	48,400
3 and 4 years	1927 and 1928	78,142	5.3	39,000
5 to 10 years	1921 to 1926	283,296	19.1	4,700
11 to 15 years	1916 to 1920	64,122	4.4	13,000
16 years and older	1915 and before	954,659	64.6	—
All Ages		1,477,013	100.0	—
Subdistrict Y-2				
1 and 2 years	1929 and 1930	17,385	5.5	8,700
3 and 4 years	1927 and 1928	6,954	2.2	3,500
5 to 10 years	1921 to 1926	24,464	7.8	4,100
11 to 15 years	1916 to 1920	7,854	2.5	1,600
16 years and older	1915 and before	257,502	82.0	—
All Ages		314,159	100.0	—
Subdistrict Y-3				
1 and 2 years	1929 and 1930	7,956	4.5	4,000
3 and 4 years	1927 and 1928	3,165	1.8	1,600
5 to 10 years	1921 to 1926	13,435	7.7	2,200
11 to 15 years	1916 to 1920	6,655	3.8	1,300
16 years and older	1915 and before	144,714	82.2	—
All Ages		175,975	100.0	—
Subdistrict Y-4				
1 and 2 years	1929 and 1930	1,128	0.9	500
3 and 4 years	1927 and 1928	449	0.4	200
5 to 10 years	1921 to 1926	6,878	5.6	1,100
11 to 15 years	1916 to 1920	3,028	2.4	600
16 years and older	1915 and before	112,543	90.7	—
All Ages		124,026	100.0	—
Subdistrict Y-5				
1 and 2 years	1929 and 1930	2,803	4.3	1,400
3 and 4 years	1927 and 1928	758	1.2	400
5 to 10 years	1921 to 1926	2,592	3.9	400
11 to 15 years	1916 to 1920	2,181	3.3	400
16 years and older	1915 and before	57,380	87.3	—
All Ages		65,714	100.0	—
Subdistrict Y-6				
1 and 2 years	1929 and 1930	2,202	9.9	1,100
3 and 4 years	1927 and 1928	764	3.4	400
5 to 10 years	1921 to 1926	799	3.6	130
11 to 15 years	1916 to 1920	575	2.6	100
16 years and older	1915 and before	17,866	80.5	—
All Ages		22,206	100.0	—

Source of data:

Op. Cit. Table 23.

Table 26. Estimated Number and Percentage of Apple Trees of 16 Important Varieties in Commercial Orchards, United States, Box States and Barrel States, Jan. 1, 1928

Variety	United States		Box States		Barrel States	
	1,000 trees	Per cent	1,000 trees	Per. cent	1,000 trees	Per cent
Delicious	6,826	8.4	1,871	12.1	4,955	7.6
Winesap	6,617	8.2	2,478	16.0	4,139	6.4
Jonathan	6,334	7.8	2,341	15.1	3,993	6.1
Baldwin	5,519	6.8	16	.1	5,503	8.4
Stayman	5,076	6.3	264	1.7	4,812	7.4
Ben Davis	4,529	5.6	203	1.3	4,326	6.6
Rome Beauty	4,180	5.2	1,704	11.0	2,476	3.8
York Imperial	3,604	4.5	53	.3	3,551	5.4
McIntosh	3,340	4.1	461	3.0	2,879	4.4
Grimes Golden	2,465	3.1	122	.8	2,343	3.6
Yellow Newtown	2,326	2.9	1,930	12.4	396	.6
Wealthy	2,073	2.6	38	.2	2,035	3.1
Yellow Transparent	1,863	2.3	24	.2	1,839	2.8
R. I. Greening	1,451	1.8	3	—	1,448	2.2
Northern Spy	1,395	1.7	40	.3	1,355	2.1
Gravenstein	1,285	1.6	1,079	7.0	206	.3
Others	21,922	27.1	2,874	18.5	19,048	29.2
Total	80,805	100.0	15,501	100.0	65,304	100.0

Source of data:

U. S. Dept. of Agri., Y. B., 1931, pp. 720-721.

Table 27. Estimated Number of Apple Trees of Various Ages of 16 Important Varieties in Commercial Orchards, United States, Box States, and Barrel States, Jan. 1, 1928 (Thousand trees)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years†	44 to 53 years‡	54 years and over‡	Total all ages
United States								
Delicious	1,108	3,882	1,738	91	6*	—	1	6,826
Winesap	407	2,234	3,187	654	93	11	31	6,617
Jonathan	501	2,172	2,880	658	118	4	1	6,334
Baldwin	211	1,109	1,377	838	1,150*	466	368	5,519
Stayman Winesap	410	2,557	1,920	165	9	1	14	5,076
Ben Davis	61	481	1,456	2,039	443*	26	23	4,529
Rome Beauty	249	1,279	2,252	282	93	11	14	4,180
York Imperial	75	616	1,934	797	149	13	20	3,604
McIntosh	661	1,449	1,102	116	10*	—	*2	3,340
Grimes Golden	178	1,169	859	225	30	2	2	2,465
Yellow Newtown	30	149	1,300	532	194	52	19	2,326
Wealthy	77	793	862	248	78*	4	11	2,073
Yellow Transparent	173	1,157	419	98	13*	3	—	1,563
Rhode Island Greening	118	278	337	192	173*	180	173	1,451
Northern Spy	122	326	478	210	146*	65	48	1,285
Gravenstein	46	407	660	118	40*	4	10	1,285
All other varieties	1,950	6,555	7,713	3,594	1,279*	446	385	21,922
Total (All varieties)	6,377	26,613	30,474	10,907	4,024*	1,288	1,122	80,805

(Continued on next page)

Table 27 (Continued)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years	44 to 53 years	54 years and over	Total all ages
Box States								
Delicious	222	694	930	22	2	—	1	1,871
Winesap	108	356	1,907	96	9	—	2	2,478
Jonathan	18	228	1,954	129	11	1	—	2,341
Baldwin	—	1	4	7	4	—	—	16
Stayman Winesap	5	37	214	8	—	—	—	264
Ben Davis	—	19	39	119	26	—	—	203
Rome Beauty	41	218	1,386	53	5	—	1	1,704
York Imperial	—	1	40	11	1	—	—	53
McIntosh	33	19	357	52	—	—	—	461
Grimes Golden	—	11	103	6	2	—	—	122
Yellow Newtown	23	117	1,226	392	129	39	4	1,930
Wealthy	—	5	17	11	5	—	—	38
Yellow Transparent	1	4	11	6	2	—	—	24
Rhode Island Greening	—	1	1	1	—	—	—	3
Northern Spy	—	1	25	8	4	2	—	40
Gravenstein	33	315	604	91	25	3	3	1,079
All other varieties	82	374	1,854	426	99	32	7	2,874
Total (All varieties)	566	2,401	10,672	1,438	324	77	23	15,501
Barrel States								
Delicious	886	3,188	808	69	4*	—	—	4,955
Winesap	299	1,878	1,280	558	84	11	29	4,139
Jonathan	483	1,944	926	529	107	3	1	3,993
Baldwin	211	1,108	1,373	831	1,146*	466	368	5,503
Stayman Winesap	405	2,520	1,706	157	9	1	14	4,812
Ben Davis	61	462	1,417	1,920	417*	26	23	4,326
Rome Beauty	208	1,061	866	229	88	11	13	2,476
York Imperial	75	615	1,894	786	148	13	20	3,551
McIntosh	628	1,430	745	64	10*	—	2	2,879
Grimes Golden	178	1,158	756	219	28	2	2	2,343
Yellow Newtown	7	32	74	190	65	13	15	396
Wealthy	77	788	845	237	73*	4	11	2,035
Yellow Transparent	172	1,153	408	92	11	3	—	1,839
Rhode Island Greening	118	277	336	191	173*	180	173	1,448
Northern Spy	122	325	453	202	142*	63	48	1,355
Gravenstein	13	92	56	27	15*	1	2	206
All other varieties	1,868	6,181	5,859	3,168	1,180*	414	378	19,048
Total (All varieties)	5,811	24,212	19,802	9,469	3,700*	1,211	1,099	65,304

*Includes trees 34 years and older in New England.

†Includes trees 34 years and older in New Jersey.

‡Does not include trees of this age in New Jersey and New England.

Source of data:

U. S. Dept. of Agri., Y. B., 1931, pp. 722-724.

Table 28. Estimated Number of Apple Trees of Various Ages of 16 Important Varieties in Commercial Orchards, Pacific States, Mountain States, and West North Central States, Jan. 1, 1928

(Thousand trees)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years	44 to 53 years	54 years and over	Total all ages
Pacific States								
Delicious	179	584	764	20	1	—	1	1,549
Winesap	104	335	1,695	55	1	—	2	2,192
Jonathan	9	90	1,143	29	1	—	—	1,272
Baldwin	—	1	3	7	4	—	—	15
Stayman Winesap	1	26	166	5	—	—	—	193
Ben Davis	—	—	2	7	4	—	—	13
Rome Beauty	30	164	963	19	2	—	1	1,179
York Imperial	—	—	—	—	—	—	—	—
McIntosh	2	2	4	—	—	—	—	8
Grimes Golden	—	4	40	1	—	—	—	45
Yellow Newtown	23	117	1,190	392	129	39	4	1,894
Wealthy	—	—	—	—	—	—	—	—
Yellow Transparent	1	3	8	2	1	—	—	15
Rhode Island Greening	—	—	—	—	—	—	—	—
Northern Spy	—	1	24	6	4	2	—	37
Gravenstein	33	315	604	91	25	3	8	1,079
All other varieties	54	244	1,334	299	77	28	7	2,043
Total (All varieties)	436	1,886	7,940	933	249	72	23	11,531
Mountain States								
Delicious	43	110	166	2	1	—	—	322
Winesap	4	21	212	41	8	—	—	286
Jonathan	9	138	811	100	10	1	—	1,069
Baldwin	—	—	1	—	—	—	—	1
Stayman Winesap	4	11	48	3	—	—	—	66
Ben Davis	—	19	37	112	22	—	—	190
Rome Beauty	11	54	423	34	3	—	—	525
York Imperial	—	1	40	11	1	—	—	53
McIntosh	31	17	353	52	—	—	—	453
Grimes Golden	—	7	63	5	2	—	—	77
Yellow Newtown	—	—	36	—	—	—	—	36
Wealthy	—	5	17	11	5	—	—	38
Yellow Transparent	—	1	3	4	1	—	—	9
Rhode Island Greening	—	1	1	1	—	—	—	3
Northern Spy	—	—	1	2	—	—	—	3
Gravenstein	—	—	—	—	—	—	—	—
All other varieties	28	130	520	127	22	4	—	831
Total (All varieties)	130	515	2,732	505	75	5	—	3,962
West North Central States								
Delicious	167	306	37	13	—	—	—	523
Winesap	87	193	61	73	9	—	—	423
Jonathan	267	535	157	204	56	—	—	1,219
Baldwin	—	—	—	—	—	—	—	—
Stayman Winesap	43	137	33	8	—	—	—	221
Ben Davis	19	46	175	323	80	1	—	644
Rome Beauty	9	20	1	1	1	—	—	31
York Imperial	32	80	31	34	19	—	—	191

(Continued on next page)

Table 28 (Continued)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years	44 to 53 years	54 years and over	Total all ages
McIntosh	16	4	—	—	—	—	—	—
Grimes Golden	48	166	71	57	6	—	—	20
Yellow Newtown	—	—	—	—	—	—	—	348
Wealthy	9	118	73	98	1	—	—	—
Yellow Transparent	14	22	3	7	—	—	—	299
Rhode Island Greening	—	—	—	—	—	—	—	46
Northern Spy	—	—	—	—	—	—	—	—
Gravenstein	—	—	—	—	—	—	—	—
All other varieties	269	600	386	503	60	3	1	—
Total (All varieties)	980	2,227	1,028	1,321	232	4	1	5,793

Source of data:

Op. Cit. Table 27.

Table 29. Estimated Number of Apple Trees of Various Ages of 16 Important Varieties in Commercial Orchards, East North Central States, South Central States, and South Atlantic States, Jan. 1, 1928

(Thousand trees)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years	44 to 53 years	54 years and over	Total all ages
East North Central States								
Delicious	188	821	132	11	1	—	—	1,153
Winesap	53	431	92	57	10	1	—	644
Jonathan	102	856	324	201	49	3	1	1,536
Baldwin	15	263	147	91	61	44	26	647
Slayman Winesap	80	641	166	10	—	—	—	897
Ben Davis	3	61	199	431	91	7	3	795
Rome Beauty	58	380	359	98	51	1	11	958
York Imperial	2	63	69	20	5	1	—	160
McIntosh	95	145	66	4	3	—	1	314
Grimes Golden	51	444	232	100	11	1	1	840
Yellow Newtown	—	—	—	—	—	—	—	—
Wealthy	15	184	247	62	49	3	10	570
Yellow Transparent	38	546	126	35	6	1	—	752
Rhode Island Greening	14	31	22	21	14	16	13	131
Northern Spy	31	117	160	55	39	23	17	442
Gravenstein	—	—	—	—	—	—	—	—
All other varieties	330	1,450	1,288	773	305	91	88	4,325
Total (All varieties)	1,075	6,433	3,629	1,969	695	192	171	14,164
South Central States								
Delicious	213	491	105	27	—	—	—	836
Winesap	98	370	156	73	15	2	—	714
Jonathan	91	310	103	81	1	—	—	586
Baldwin	—	—	—	—	—	—	—	—
Slayman Winesap	110	290	52	18	—	—	—	470
Ben Davis	32	206	353	528	25	8	1	1,153
Rome Beauty	47	99	63	16	3	2	—	230
York Imperial	5	61	24	11	8	7	—	116
McIntosh	—	—	—	—	—	—	—	—
Grimes Golden	44	129	28	16	—	—	—	217

(Continued on next page)

Table 29 (Continued)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years†	44 to 53 years‡	54 years and over‡	Total all ages
South Atlantic States (Cont'd.)								
*Yellow Newtown	—	—	—	—	—	—	—	—
Wealthy	—	1	6	—	—	—	—	7
Yellow Transparent	93	183	59	11	—	—	—	346
Rhode Island Greening	—	—	10	—	—	—	—	10
Northern Spy	—	—	—	—	—	—	—	—
Gravenstein	—	—	—	—	—	—	—	—
All other varieties	413	957	528	464	70	15	7	2,454
Total (All varieties)	1,146	3,097	1,487	1,245	122	34	8	7,139
South Atlantic States								
Delicious	159	926	402	9	1	—	—	1,497
Winesap	55	817	907	342	48	7	29	2,205
Jonathan	10	122	237	19	—	—	—	388
Baldwin	1	12	29	22	4	2	1	71
Stayman Winesap	89	846	1,025	86	8	1	14	2,069
Ben Davis	5	103	376	337	49	4	15	889
Rome Beauty	44	262	290	92	30	7	1	726
York Imperial	24	333	1,514	520	87	4	19	2,501
McIntosh	3	25	8	—	—	—	—	36
Grimes Golden	19	303	348	21	4	1	—	696
Yellow Newtown	6	27	70	183	61	13	14	374
Wealthy	1	35	16	2	1	—	—	55
Yellow Transparent	18	274	154	24	3	1	—	474
Rhode Island Greening	—	—	—	—	—	—	—	—
Northern Spy	1	2	8	2	1	1	—	15
Gravenstein	—	5	—	—	—	—	—	5
All other varieties	309	1,722	1,955	750	229	100	59	5,124
Total (All varieties)	744	5,814	7,339	2,409	526	141	152	17,125

Source of data:

Op. Cit. Table 27.

Table 30. Estimated Number of Apple Trees of Various Ages of 16 Important Varieties in Commercial Orchards, Middle Atlantic States and New England States, Jan. 1, 1928

(Thousand trees)

Varieties	3 years and less	4 to 13 years	14 to 23 years	24 to 33 years	34 to 43 years†	44 to 53 years‡	54 years and over‡	Total all ages
Middle Atlantic States								
Delicious	124	469	106	7	1	—	—	707
Winesap	6	63	62	13	2	1	—	147
Jonathan	13	120	105	24	1	—	—	263
Baldwin	81	416	818	423	377	420	341	2,876
Hayman Winesap	83	606	430	35	1	—	—	1,155
Ben Davis	2	35	243	167	53	6	4	510
Rome Beauty	49	298	153	22	3	1	1	527
Fork Imperial	12	78	256	201	29	1	1	578
McIntosh	364	688	376	25	2	—	1	1,456
Primes Golden	16	116	77	25	7	—	1	242
Fellow Newtown	1	5	4	7	4	—	1	22
Wealthy	25	307	402	63	15	1	1	844
Fellow Transparent	7	108	57	14	2	1	—	189
Rhode Island Greening	101	231	268	142	100	164	160	1,166
Northern Spy	63	159	227	105	54	39	31	678
Gravenstein	1	17	18	12	4	1	2	55
All other varieties	442	1,123	1,363	515	252	205	223	4,123
Total (All varieties)	1,390	4,839	4,965	1,800	907	840	767	15,508
New England States								
Delicious	35	175	26	2	1*	—	—	239
Winesap	—	4	2	—	—	—	—	6
Jonathan	—	1	—	—	—	—	—	1
Baldwin	114	417	379	295	704*	—	—	1,909
Hayman Winesap	—	—	—	—	—	—	—	—
Ben Davis	—	11	71	134	119*	—	—	335
Rome Beauty	1	2	—	—	—	—	—	3
Fork Imperial	—	—	—	—	—	—	—	—
McIntosh	150	568	295	35	5*	—	—	1,053
Primes Golden	—	—	—	—	—	—	—	—
Fellow Newtown	—	—	—	—	—	—	—	—
Wealthy	27	143	101	12	7*	—	—	290
Fellow Transparent	2	20	9	1	—	—	—	32
Rhode Island Greening	3	15	36	28	59*	—	—	141
Northern Spy	27	47	58	40	48*	—	—	220
Gravenstein	12	70	38	15	11*	—	—	146
All other varieties	105	329	339	163	264*	—	—	1,200
Total (All varieties)	476	1,802	1,854	725	1,218*	—	—	5,575

* Includes trees 34 years and older in New England.

† Includes trees 34 years and older in New Jersey.

‡ Does not include trees of this age in New Jersey and New England.

Source of data:

Op. Cit. Table 27.

Years Planted	Wineap	Bellevue	Jonathan	Home	Yellow	Shayam	Spitzenberg	Winter	Arkansas	Other	Total
				Beauty	Kestown		burg	Munna	Black	Peckham	Varieties
WASHINGTON											
1929-1930	49,066	295,311	4,024	14,306	5,674	153	65	2,401	461	1	20,779
1927-1928	58,156	204,135	5,141	14,447	2,478	414	22	2,994	116	2	14,567
1921-1926	172,357	399,555	22,664	51,494	1,976	5,482	1,242	16,374	2,338	1,640	32,297
1916-1920	51,550	55,206	15,995	21,355	6,723	8,476	2,702	5,249	1,942	35,854	208,068
1915 and before	1,382,596	568,587	615,357	336,607	140,733	132,237	126,718	74,046	36,152	14,666	230,509
Total	1,709,376	1,430,764	661,181	419,256	155,232	142,213	130,769	101,084	40,929	17,187	251,786
VERMONT-CLANBORN											
1929-1930	22,833	192,672	1,925	8,492	1,908	28	-	2,194	180	1	12,425
1927-1928	21,691	124,564	1,927	5,995	4,150	155	-	1,796	46	-	11,104
1921-1926	69,613	210,005	6,950	8,405	410	4,883	399	9,488	1,116	74	4,125
1916-1920	24,438	35,066	6,388	3,619	2,092	2,082	875	2,953	904	904	8,932
1915 and before	18,459	359,157	197,429	107,194	22,079	110,314	79,861	44,382	9,852	11,824	22,995
Total	757,304	916,282	212,819	135,707	28,333	117,469	77,133	64,913	11,619	12,805	44,856
YATIMA											
1929-1930	25,999	92,796	1,814	4,042	434	71	-	118	280	-	2,714
1927-1928	30,656	52,688	643	2,713	49	260	-	707	1,083	-	1,437
1921-1926	102,110	185,322	14,841	37,145	582	1,698	208	4,037	1,085	1,451	6,189
1916-1920	28,548	26,821	17,471	17,817	1,313	304	305	1,240	1,640	33	3,614
1915 and before	734,058	125,870	340,819	177,593	85,847	17,559	16,308	10,640	23,367	2,635	36,109
Total	923,368	465,607	365,870	236,046	57,604	19,782	16,823	16,742	26,340	4,119	47,032
SPEAKER											
1929-1930	28	5,329	106	564	1	1	2	1	-	-	821
1927-1928	141	22,274	410	3,767	-	1	-	-	-	-	3,406
1921-1926	141	11,879	1,096	2,289	1	7	-	275	6	-	4,725
1916-1920	-	374	2	66	-	-	-	-	-	-	244
1915 and before	13,759	27,055	55,075	80,091	6,075	2,916	7,782	9,110	897	11	29,181
Total	14,070	66,911	86,688	86,766	5,075	2,827	7,790	8,584	603	11	35,546
WALLA WALLA											
1929-1930	63	2,308	126	1,188	201	2	1	4	-	-	126
1927-1928	405	2,319	100	928	11	-	-	1	-	-	696
1921-1926	30	10,940	549	2,645	161	21	3	361	11	11	1,108
1916-1920	215	2,362	2,626	3,745	1,161	46	7	840	59	32	1,895
1915 and before	10,948	5,641	16,164	20,453	9,915	779	449	1,016	382	172	6,628
Total	11,999	23,670	19,568	39,859	11,449	847	460	1,722	448	212	119,549
WHITE SLIMON											
1929-1930	-	1,412	-	-	1,115	-	4	-	-	-	2,154
1927-1928	-	1,677	-	-	2,035	-	-	-	-	-	6,028
1921-1926	150	1,366	9	1	4,023	150	128	65	-	-	1,247
1916-1920	10	1,045	12	8	824	141	32	141	50	-	6,480
1915 and before	975	7,461	4,750	1,137	44,902	665	25,627	3,262	1,760	-	12,874
Total	538	15,001	4,741	1,146	54,637	825	24,860	3,500	1,790	-	16,944
WESTERN WASHINGTON											
1929-1930	132	794	23	29	17	54	56	84	1	-	2,359
1927-1928	45	593	61	26	24	22	820	437	22	2	2,631
1921-1926	75	2,025	440	1,091	90	22	2,183	7	17,502	7	23,979
1916-1920	132	538	534	97	540	27	698	594	12	34	50,045
1915 and before	1,101	1,228	1,798	1,743	524	459	2,695	2,695	24	44	158,418

Year	White	Black	Hispanic	Asian	Native	Other	Total
1959-1960	25,453	192,672	1,925	6,492	1,908	21,144	242,806
1961-1962	21,091	154,384	1,927	5,995	1,859	18,865	161,804
1963-1964	69,013	210,003	5,980	8,405	410	9,498	242,806
1965-1966	24,428	182,066	3,388	5,619	577	7,092	211,119
1967-1968	22,079	110,814	75,851	48,262	9,882	11,619	186,405
1969-1970	21,819	135,707	58,353	117,469	17,123	64,815	242,806
SUBDISTRICT W-1							
1971-1972	27,442	91	52	1,074	15	410	28,000
1973-1974	5,632	16,881	142	2,282	7	620	23,723
1975-1976	8,476	29,179	489	715	99	1,977	32,785
1977-1978	11,247	1,901	789	1,119	95	2,002	15,153
1979-1980	202,440	64,719	27,676	6,816	21,723	14,021	242,806
1981-1982	208,440	167,047	39,676	6,743	22,586	17,935	425,170
SUBDISTRICT W-2							
1983-1984	1,241	36,267	125	1,074	15	410	38,088
1985-1986	2,805	25,237	6	2,282	7	620	28,753
1987-1988	4,366	45,581	98	1,438	95	1,977	52,585
1989-1990	4,033	50,137	628	1,629	200	2,002	58,020
1991-1992	148,459	70,034	39,676	6,816	21,723	14,021	242,806
1993-1994	161,601	196,000	40,566	35,946	6,766	17,285	452,170
SUBDISTRICT W-3							
1995-1996	6,415	42,988	1,428	2,720	500	1,244	55,809
1997-1998	6,786	56,587	1,771	2,422	100	439	68,006
1999-2000	20,776	55,597	5,241	4,892	112	2,607	84,825
2001-2002	4,386	10,422	610	929	30	616	16,463
2003-2004	6,716	51,376	37,804	28,763	2,651	24,977	125,333
2005-2006	153,541	136,599	44,554	35,706	3,593	29,120	383,513
SUBDISTRICT W-4							
2007-2008	1,650	29,055	18	593	1,324	95	32,643
2009-2010	1,143	14,998	1	1,378	8	361	18,525
2011-2012	4,556	16,927	105	61	362	52	22,413
2013-2014	4	80	-	-	-	-	84
2015-2016	35,861	99,578	14,209	6,726	2,465	1,408	157,848
2017-2018	43,214	171,658	14,338	8,778	3,789	2,126	245,765
SUBDISTRICT W-5							
2019-2020	6,708	45,991	143	3,685	20	342	57,759
2021-2022	7,139	26,721	100	1,760	21	170	35,722
2023-2024	27,898	56,461	1,594	1,292	120	800	86,004
2025-2026	321	2,503	321	1,768	14	170	3,996
2027-2028	83,984	55,035	37,284	5,682	71	237	186,803
2029-2030	126,039	166,716	37,263	12,219	2,109	11,612	353,938
SUBDISTRICT W-4 AND W-5							
2031-2032	6,368	75,046	171	4,178	21	437	82,101
2033-2034	8,261	43,719	108	2,138	21	180	48,527
2035-2036	35,444	75,393	1,697	1,273	180	40	112,788
2037-2038	328	2,683	192	1,768	71	237	5,079
2039-2040	119,945	115,613	81,433	12,208	4,407	23,684	353,938
2041-2042	160,254	63,601	20,997	5,898	18,182	25,731	245,665
SUBDISTRICT W-4							
2043-2044	4,076	10,879	110	468	25	36	15,518
2045-2046	1,587	2,231	31	-	-	-	3,849
2047-2048	1,854	4,455	6	-	-	-	6,315
2049-2050	4,637	1,475	2,067	148	191	208	11,129
2051-2052	62,516	31,431	31,599	272	942	307	127,817
2053-2054	74,469	60,582	34,222	10,783	2,513	29,456	173,532
2055-2056	159,254	115,613	81,433	12,208	4,407	23,684	353,938
2057-2058	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2059-2060	6,708	45,991	143	3,685	20	342	57,759
2061-2062	7,139	26,721	100	1,760	21	170	35,722
2063-2064	27,898	56,461	1,594	1,292	120	800	86,004
2065-2066	321	2,503	321	1,768	14	170	3,996
2067-2068	83,984	55,035	37,284	5,682	71	237	186,803
2069-2070	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2071-2072	6,368	75,046	171	4,178	21	437	82,101
2073-2074	8,261	43,719	108	2,138	21	180	48,527
2075-2076	35,444	75,393	1,697	1,273	180	40	112,788
2077-2078	328	2,683	192	1,768	71	237	5,079
2079-2080	119,945	115,613	81,433	12,208	4,407	23,684	353,938
2081-2082	160,254	63,601	20,997	5,898	18,182	25,731	245,665
2083-2084	4,076	10,879	110	468	25	36	15,518
2085-2086	1,587	2,231	31	-	-	-	3,849
2087-2088	1,854	4,455	6	-	-	-	6,315
2089-2090	4,637	1,475	2,067	148	191	208	11,129
2091-2092	62,516	31,431	31,599	272	942	307	127,817
2093-2094	74,469	60,582	34,222	10,783	2,513	29,456	173,532
2095-2096	159,254	115,613	81,433	12,208	4,407	23,684	353,938
2097-2098	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2099-2100	6,708	45,991	143	3,685	20	342	57,759
2101-2102	7,139	26,721	100	1,760	21	170	35,722
2103-2104	27,898	56,461	1,594	1,292	120	800	86,004
2105-2106	321	2,503	321	1,768	14	170	3,996
2107-2108	83,984	55,035	37,284	5,682	71	237	186,803
2109-2110	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2111-2112	6,368	75,046	171	4,178	21	437	82,101
2113-2114	8,261	43,719	108	2,138	21	180	48,527
2115-2116	35,444	75,393	1,697	1,273	180	40	112,788
2117-2118	328	2,683	192	1,768	71	237	5,079
2119-2120	119,945	115,613	81,433	12,208	4,407	23,684	353,938
2121-2122	160,254	63,601	20,997	5,898	18,182	25,731	245,665
2123-2124	4,076	10,879	110	468	25	36	15,518
2125-2126	1,587	2,231	31	-	-	-	3,849
2127-2128	1,854	4,455	6	-	-	-	6,315
2129-2130	4,637	1,475	2,067	148	191	208	11,129
2131-2132	62,516	31,431	31,599	272	942	307	127,817
2133-2134	74,469	60,582	34,222	10,783	2,513	29,456	173,532
2135-2136	159,254	115,613	81,433	12,208	4,407	23,684	353,938
2137-2138	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2139-2140	6,708	45,991	143	3,685	20	342	57,759
2141-2142	7,139	26,721	100	1,760	21	170	35,722
2143-2144	27,898	56,461	1,594	1,292	120	800	86,004
2145-2146	321	2,503	321	1,768	14	170	3,996
2147-2148	83,984	55,035	37,284	5,682	71	237	186,803
2149-2150	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2151-2152	6,368	75,046	171	4,178	21	437	82,101
2153-2154	8,261	43,719	108	2,138	21	180	48,527
2155-2156	35,444	75,393	1,697	1,273	180	40	112,788
2157-2158	328	2,683	192	1,768	71	237	5,079
2159-2160	119,945	115,613	81,433	12,208	4,407	23,684	353,938
2161-2162	160,254	63,601	20,997	5,898	18,182	25,731	245,665
2163-2164	4,076	10,879	110	468	25	36	15,518
2165-2166	1,587	2,231	31	-	-	-	3,849
2167-2168	1,854	4,455	6	-	-	-	6,315
2169-2170	4,637	1,475	2,067	148	191	208	11,129
2171-2172	62,516	31,431	31,599	272	942	307	127,817
2173-2174	74,469	60,582	34,222	10,783	2,513	29,456	173,532
2175-2176	159,254	115,613	81,433	12,208	4,407	23,684	353,938
2177-2178	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2179-2180	6,708	45,991	143	3,685	20	342	57,759
2181-2182	7,139	26,721	100	1,760	21	170	35,722
2183-2184	27,898	56,461	1,594	1,292	120	800	86,004
2185-2186	321	2,503	321	1,768	14	170	3,996
2187-2188	83,984	55,035	37,284	5,682	71	237	186,803
2189-2190	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2191-2192	6,368	75,046	171	4,178	21	437	82,101
2193-2194	8,261	43,719	108	2,138	21	180	48,527
2195-2196	35,444	75,393	1,697	1,273	180	40	112,788
2197-2198	328	2,683	192	1,768	71	237	5,079
2199-2200	119,945	115,613	81,433	12,208	4,407	23,684	353,938
2201-2202	160,254	63,601	20,997	5,898	18,182	25,731	245,665
2203-2204	4,076	10,879	110	468	25	36	15,518
2205-2206	1,587	2,231	31	-	-	-	3,849
2207-2208	1,854	4,455	6	-	-	-	6,315
2209-2210	4,637	1,475	2,067	148	191	208	11,129
2211-2212	62,516	31,431	31,599	272	942	307	127,817
2213-2214	74,469	60,582	34,222	10,783	2,513	29,456	173,532
2215-2216	159,254	115,613	81,433	12,208	4,407	23,684	353,938
2217-2218	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2219-2220	6,708	45,991	143	3,685	20	342	57,759
2221-2222	7,139	26,721	100	1,760	21	170	35,722
2223-2224	27,898	56,461	1,594	1,292	120	800	86,004
2225-2226	321	2,503	321	1,768	14	170	3,996
2227-2228	83,984	55,035	37,284	5,682	71	237	186,803
2229-2230	126,039	166,716	37,263	12,219	2,109	11,612	353,938
2231-2232	6,368	75,046	171	4,178	21	437	82,101
2233-2234	8,261	43,719	108	2,138	21	180	48,527
2235-2236	35,444	75,393	1,697	1,273	180	40	112,788
2237-2238	328	2,683	192	1,768	71	237	5,079
2239-2240	119,945	115,613	81,433	12,208	4,407	23,684	353,938
2241-2242	16						

Source of data:
Op. Cit. Table 23.

Table 33. Number of Apple Trees of Principal Varieties Planted in Various Years, Yakima District by Subdistricts, 1931

Year Planted	Winesap	Delicious	Jonathan	Rose Beauty	Yellow Newtown	Stayman	Elberta	Winter Banana	Arkansas Black	Parma	Other Varieties	Total
YAKIMA DISTRICT												
1929-1930	25,999	92,796	1,614	4,042	434	71	-	116	280	-	2,714	128,268
1927-1928	30,656	52,688	643	5,731	48	250	2	407	70	-	1,437	90,233
1921-1926	102,110	163,322	14,821	37,163	582	1,958	208	4,037	1,083	1,461	5,159	331,514
1916-1920	36,545	29,821	7,473	13,817	723	304	508	1,240	1,540	35	2,614	84,415
1915 and before	735,068	125,980	340,819	177,293	55,847	17,558	16,308	10,640	23,357	2,635	26,158	1,544,664
Total	923,348	453,607	365,970	236,046	57,604	17,762	16,823	16,742	21,340	4,119	49,082	2,179,095
SUBDISTRICT I-1												
1929-1930	21,149	71,395	544	2,926	269	6	-	80	280	-	146	84,794
1927-1928	26,992	46,362	800	3,489	48	250	2	115	70	-	146	75,142
1921-1926	87,245	135,883	12,538	35,103	340	1,447	207	3,066	799	1,461	2,158	233,284
1916-1920	19,301	15,885	6,502	11,399	566	276	289	922	1,012	2,464	1,921	64,122
1915 and before	446,752	51,939	237,248	115,874	34,367	10,561	11,090	4,746	12,140	2,464	16,275	964,689
Total	581,439	362,151	257,512	166,891	35,590	12,541	11,588	8,959	16,291	5,628	20,223	1,477,013
SUBDISTRICT I-2												
1929-1930	3,802	12,688	6	339	-	-	-	-	-	-	1,150	17,985
1927-1928	2,350	3,157	5	44	-	-	-	-	-	-	614	6,954
1921-1926	10,366	11,460	578	877	132	120	-	359	40	-	887	24,464
1916-1920	3,682	2,085	365	710	45	28	12	28	28	-	234	7,584
1915 and before	143,596	15,581	44,286	26,022	6,002	2,738	1,313	2,580	5,545	93	7,765	357,732
Total	165,076	44,971	45,215	26,132	6,187	2,862	1,325	3,631	5,665	93	10,321	318,109
SUBDISTRICT I-3												
1929-1930	1,317	5,656	636	127	164	-	-	-	-	-	86	7,956
1927-1928	2,009	1,919	25	66	-	-	-	-	-	-	48	5,145
1921-1926	3,136	8,272	327	1,008	66	28	1	35	216	-	394	13,485
1916-1920	2,351	1,964	856	1,093	100	-	4	160	156	-	298	6,635
1915 and before	77,017	10,481	23,017	13,288	9,096	1,795	1,293	1,334	3,868	160	5,435	144,714
Total	84,999	28,192	24,560	15,581	9,426	1,763	1,298	1,529	4,234	162	6,231	175,976
SUBDISTRICT I-4												
1929-1930	60	425	12	22	-	-	-	30	-	-	879	1,138
1927-1928	65	102	-	-	-	-	-	6	-	-	476	643
1921-1926	1,354	3,767	32	415	4	-	-	488	36	-	89	5,088
1916-1920	60,301	7,325	21,049	14,477	2,026	688	512	1,081	868	812	3,742	112,643
1915 and before	28,024	9,642	10,464	5,627	2,043	662	512	1,634	693	212	4,986	124,026
Total	89,146	18,132	21,985	14,962	6,512	1,464	1,024	3,242	1,634	1,024	6,166	2,179,095
SUBDISTRICT I-6												
1929-1930	66	1,940	591	113	1	-	-	6	-	-	184	2,802
1927-1928	19	549	31	26	-	-	-	5	-	-	131	758
1921-1926	286	800	46	46	-	-	-	119	-	-	1,346	2,692
1916-1920	16	534	144	-	-	-	-	40	-	-	1,447	2,181
1915 and before	28,024	9,642	10,464	5,627	2,043	662	512	1,634	693	212	4,986	124,026
Total	28,361	10,089	10,464	5,627	2,043	662	512	1,634	693	212	4,986	124,026
1929-1930	206	792	25	616	-	-	-	-	-	-	600	2,202
1927-1928	28	708	-	-	-	-	-	-	-	-	764	1,520

HUDSON, C. B.

1931. Neither a buyer nor a seller be. Proceedings of 22nd annual meeting Poultry Science Assoc. July 9-11, 1930. p. 78-81. [MacDonald College, Quebec, Canada.]
- 1931a. The influence and environmental temperature on the mortality in chicks inoculated with the virus of infectious bronchitis. [Abstract.] Abstract and notes on 23rd annual meeting Poultry Science Assoc., Lexington, Kentucky, Aug. 10-12, 1931.

ILLINOIS AGRICULTURAL EXPERIMENT STATION.

1928. Measures sought for checking fowl bronchitis. Illinois Agr. Exp. Sta. 41st Ann. Rpt. 1927-28:174-175.
1929. Establish many characteristics of fowl bronchitis. Illinois Agr. Exp. Sta. 42nd Ann. Rpt. 1928-29:116-117.
1930. Pathogenic organism involved in bronchitis of fowls. Illinois Agr. Exp. Sta. 43rd Ann. Rpt. 1929-30:104-107.

INDIANA AGRICULTURAL EXPERIMENT STATION.

1928. Chicken pox and roup. Indiana Agr. Exp. Sta. Dept. of Vet. Sci. 41st Ann. Rpt. 1927-28:62.
1929. Investigation of disease outbreaks. Indiana Agr. Exp. Sta. 42nd Ann. Rpt. Dept. of Vet. Sci. 1928-29:70.

KAUPP, B. F.

1917. Poultry diseases. 169 p. American Veterinary Publishing Co., Chicago, Ill.
1924. Bronchitis a common ailment. Vet. Med. 19:651-652.
1929. Poultry diseases. 5th ed. 436 p. Alexander Eger, Chicago, Ill.

KERNOHAN, GEORGE.

1930. Infectious bronchitis in fowls. California Agr. Exp. Sta. Bul. 494:1-22.
- 1931a. Infectious laryngotracheitis of fowls. Jour. Amer. Vet. Med. Assoc. 78(n.s. 31):196-202.
- 1931b. Infectious laryngotracheitis in pheasants. Jour. Amer. Vet. Med. Assoc. 78(n.s. 31):553-554.

KOMAROV, A., and F. R. BEAUDETTE.

1931. Some observations on the distribution of virus in the body of birds affected with infectious bronchitis with special reference to the carrier state. [Abstract.] Abstracts and Notes of 23rd annual meeting Poultry Science Assoc., Lexington, Kentucky, Aug. 10-12, 1931.

MAY, R. G., and R. P. TITSLER.

1925. Tracheo-laryngitis in poultry. Jour. Amer. Vet. Med. Assoc. 67 (n.s. 20):229-231.

McCOSH, N. A.

1925. Infectious bronchitis in poultry. Vet. Med. 20:87.
1928. Infectious bronchitis in poultry. Vet. Med. 23:207.

MISSOURI AGRICULTURAL EXPERIMENT STATION.

1925. Suspected fowl plague. In Missouri Agr. Exp. Sta. Ann. Rpt. 1924-25. Missouri Agr. Exp. Sta. Bul. 236:87.

NEW JERSEY AGRICULTURAL EXPERIMENT STATION.

1924. Dept. of Poultry Husbandry Rpt. New Jersey Agr. Exp. Sta. 37th Ann. Rpt. 1923-24:120-26.

1926. Dept. of Poultry Husbandry Rpt. New Jersey Agr. Exp. Sta. 38th Ann. Rpt. 1925-26:199.

PEARL, RAYMOND, F. M., SURFACE, and M. R. CURTIS.

1920. Diseases of poultry. 162 p. MacMillan Co., New York City.

ROBINSON, J. H.

1917. The common sense poultry doctor. 176 p. Farms Poultry Publishing Co., Boston, Mass.

SALMON, D. E.

1899. Diseases of poultry. 246 p. George E. Howard, Washington, D. C.

~~SEAFORTH~~ C. E., and C. M. HAMILTON.

1929. Infectious bronchitis in fowl. Washington Agr. Exp. Sta. Quart. Bul. n.s. 14-W:38-42.

1930. Infectious bronchitis. Washington Agr. Exp. Sta. Quart. Bul. n.s. 18-W:36-38.

SCHALK, A. F., and M. C. HAWN.

1931. An apparently new respiratory disease of baby chicks. Jour. Amer. Vet. Med. Assoc. 78(n.s. 31):413-422.

SEIFRIED, OSKAR.

1931. Intranuclear inclusions in laryngotracheitis of chickens. Science 73(1900):594-595.

STAFSETH, H. J.

1925. Report of the Section of Bacteriology. Avian Pathology. Michigan Agr. Exp. Sta. Rpt. 1924-25:198.

VAN HEELSBERGEN, T.

1929. Infektiose Bronchitis der Hühner. Handbuch der Geflügelkrankheiten und Geflügelzucht. 608 p. Ferdinand Enke, Stuttgart.

WARD, A. R., and B. A. GALLAGHER.

1920. Diseases of domesticated birds. 333 p. MacMillan Co., New York City.

WEAVER, C. H.

1929. Infectious bronchitis of fowl. Poultry Div. Rpt. Dept. of Agr. Dominion Experimental Farms, Ottawa, Canada, 128:67-69.

